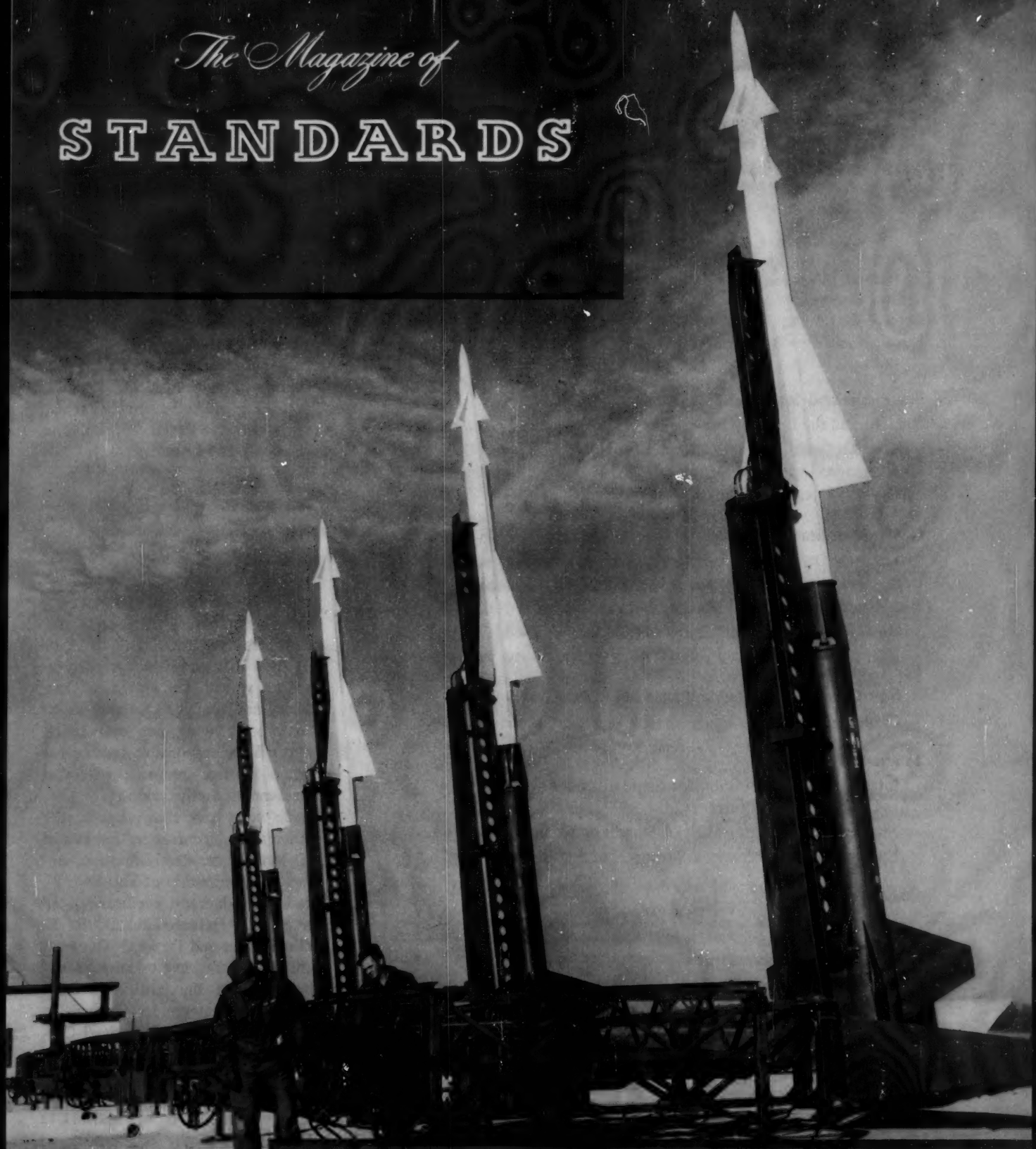
The Magazine of

STANDARDS



Nike guided missiles poised in vertical firing position

(For new standards program of Department of Defense, p 76)

March 1955

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Formerly Standardization

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In This Issue

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MARGINAL NOTES

Roger Gay to Defense Department—

News of interest to all standards men is tucked casually into one paragraph of an article in this issue. This is the announcement in "The New Defense Standardization Program" by Charles J. Eiwen (page 76) that Roger E. Gay will head the Department of Defense program on standardization this year. Mr Gay is president of The Bristol Brass Corporation and for the past three years president of the American Standards Association. He is being given a leave of absence starting in May to become Director of Cataloging, Standardization, and Inspection of the Department of Defense. In this capacity, Mr Gay will be in charge of the new standardization program described in Mr Eiwen's article. He will serve directly under the Assistant Secretary of Defense for Supply and Logistics.

The Paul G. Agnew Foundation—

As a tribute to the pioneering work done by the late Dr Paul G. Agnew in developing standardization on a national and international level, a number of his friends and associates have established the Paul G. Agnew Foundation. Its purpose is "to spread knowledge of the theory and practice of standardization among young men and women who will be responsible for the future of the free-enterprise system so fundamental to this country."

To carry out this purpose, the Foundation has arranged a series of 10 lectures on standardization, under the sponsorship of Tau Beta Pi, national honorary engineering society. The lecturers are Dr R. E. Zimmerman and Dr H. S. Osborne, both of whom have taken a prominent part in standardization work during their careers. Dr Zimmerman is consultant to the U.S. Steel Corporation from which he retired as vice-president a few years ago. He was president of the American Standards Association from 1941 to 1943. Dr Osborne is a consulting engineer and retired chief engineer

of the American Telephone and Telegraph Company. He is president of the International Electrotechnical Commission. He served as chairman of ASA's Standards Council from 1942 through 1945 and as vice-president in 1949.

Lectures in the series have already been given at the College of the City of New York (February 16); Massachusetts Institute of Technology (February 23); Rensselaer Polytechnic Institute (March 3); Purdue University (March 7); University of Illinois (March 8); Stevens Institute of Technology (March 9). Others are scheduled at Pennsylvania State College (March 31); Cornell University (April 7); and Columbia University (April 14).

Those backing the Foundation explain: "In the development and promotion of standards no one played a greater part than Paul G. Agnew. It was his deep conviction in the essentiality of sound standards as a basic principle of our free-enterprise system, his courageous struggle to have this principle recognized and applied, and his disregard for his physical health and personal comfort that to a large extent made possible the success of the movement both nationally and internationally."

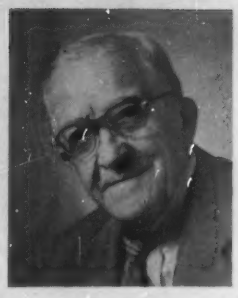
Spring Meeting, Company Member Conference—

May 16 and 17 is the date; Plankinton Hotel, Milwaukee, Wisconsin, the place for the Spring Meeting of the Company Member Conference. Details of the program will be announced in the April issue. Make plans now to attend this meeting. Subjects of special interest to company standards departments will be discussed.

Erratum—

On page 11 of the January, 1955 issue, the photographs identified as those of Knox McIlwaine and J. W. Wentworth were transposed.

Front Cover — U.S. Army photo.



This Month's Standards Personality

Fred H. Colvin

Fred H. Colvin, editor emeritus of *American Machinist,* is receiving the Gold Medal of the American Society of Tool Engineers this month. Now 87, he has just finished his fifty-fifth book, and is co-author of *American Machinists' Handbook,* now in its ninth edition.

Fred Colvin started work with machines as an apprentice when he was 15. "I worked a 60-hour week at 5 cents an hour," he says. "After working a 10-hour day and adding one hour each way for transportation in the old GOP (get out and push) mule cars—I went to night school to study drafting." This gave him his first lift into new fields. He started his editorial and writing career in 1894 when he became editor of *Machinery.* In 1907 he joined the editorial staff of *American Machinist* and in 1937 became its editor emeritus. He still holds this title and frequently visits *American Machinist*'s offices.

"He can tell you how the Government made Springfield rifles in 1900, or how the flower boats look in the floating gardens of Xochimilco," his colleagues say. "He's been over most of the metalworking world—and remembers what he's seen. He's the man who recalls who made the Garvin lathe and the Blank screw machine 30 years ago."

Fred Colvin wrote the first articles that Henry Ford permitted to go out of his plant. He knew and worked with Packard, Olds, Stanley, and the Cadillac men when they were building the one-lungers and with the Wright brothers when they were constructing engines in their kitchen in Dayton.

In the First World War he was *American Machinist*'s special correspondent in the nation's capitol. In the Second World War he was a full-time consultant to the U.S. Bureau of Aeronautics and member of the Manufacturing Engineering Committee appointed by ASME to work with the research division of WPB. He also served as consultant at Oak Ridge, Tennessee, on the Atomic Power Project.

In 1944 Fred Colvin received his degree as Mechanical Engineer—an honorary degree from Stevens Institute of Technology. There are now three Colvins with Stevens degrees—Fred himself, his son, and his grandson.

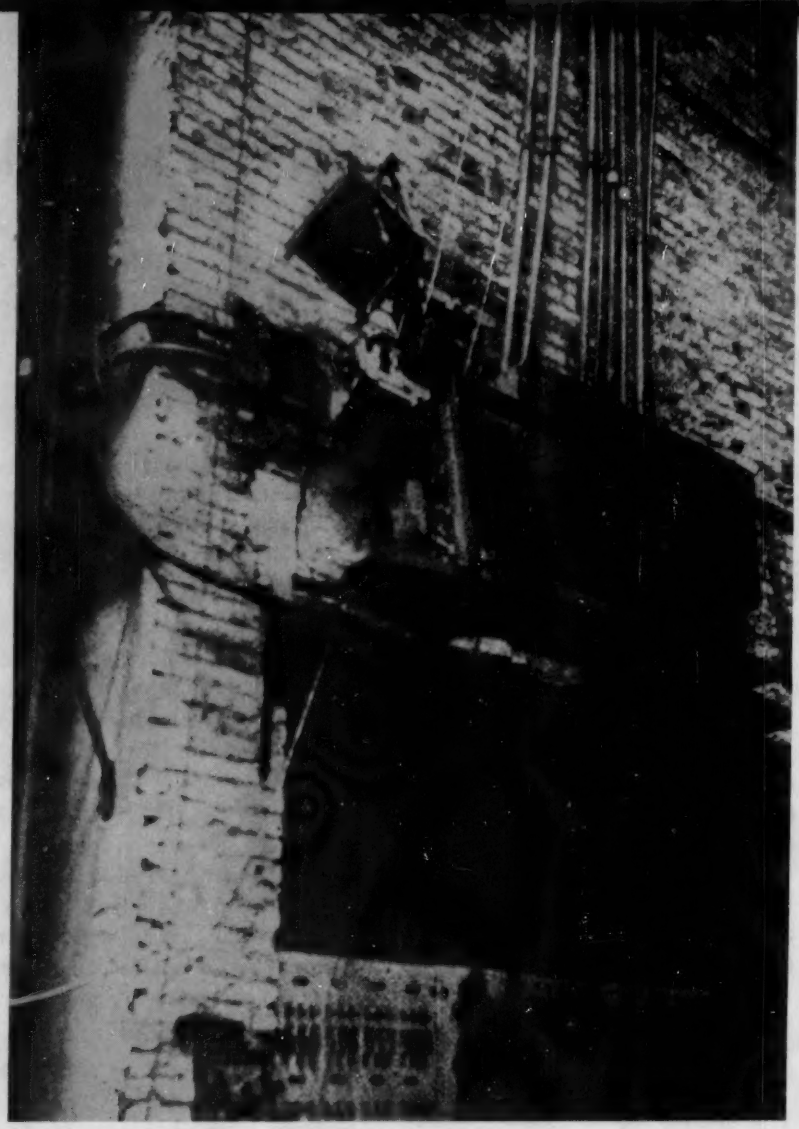
Mr Colvin has been a strong advocate of standardization. He is still a member of ASA Sectional Committee on Screw Threads, B1, and on Limits and Fits for Engineering and Manufacturing, B4.

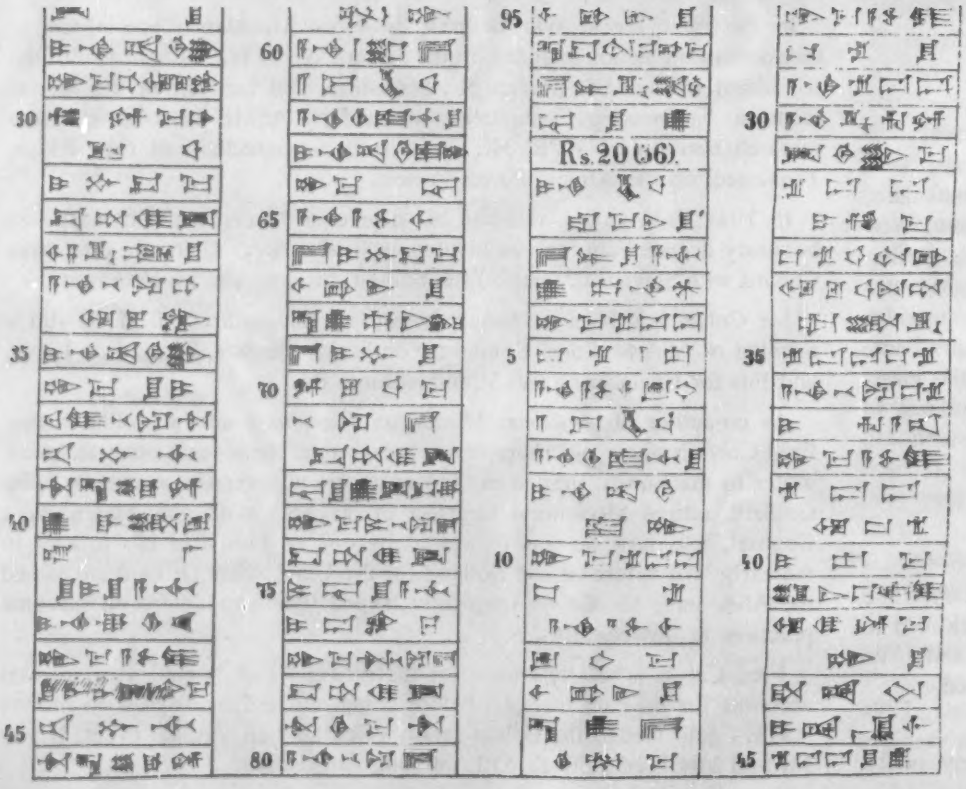
As co-author of *American Machinists' Handbook* and a prolific writer, Fred Colvin's name is perhaps better known than that of any other technical writer to machinists, draftsmen, and engineers all over the world. Dr John Gaillard, retired Mechanical Engineer of the ASA staff, now Management Counsel, tells how he was impressed by one of Fred Colvin's articles in the early '20s before he left Holland for the USA. After Dr Gaillard joined the ASA staff, Mr Colvin frequently helped him with advice on machine practices in this country.

Fred Colvin is widely known for his rare sense of humor. Perhaps that accounts for the fact that just before going out to Los Angeles to receive ASTE's gold medal, the Colvin family celebrated an unusual event. It was Mr and Mrs Fred Colvin's 65th wedding anniversary.

Darkness *was an important factor in the tragic Iroquois Theater fire in Chicago in 1903. Picture at right shows exact point of origin of the fire. Particles of carbon from the open-arc floodlight shown here ignited border draperies hanging nearby. Hundreds of Chicago theatergoers were trampled to death because no arrangements had been made to light the new theater in case of failure of normal power supply. Eyewitness testified at coroner's inquest that if secondary sources of lighting had been supplied "there would not have been one-half the loss of life in the foyer and balcony stairs. When that awful darkness fell in the house the frenzied people did not know where to turn."*

The requirement *of "reasonably safe" building construction has been recognized for more than 4000 years. Lines 64-72 of Hammurabi's Code (2100 B.C.) provide that "If a builder has built a house for a man and his work is not strong, and if the house he has built falls in and kills the householder, that builder shall be put to death." Necessary legal machinery for enforcing safety standards is often adopted too late. Too familiar is the tragic report: "Immediately after the disaster a Special Committee was appointed to revise the Building Ordinances."*





LIGHT AND THE LAW

by F. H. ELLIS

WHEN the lights go out at home there is a pleasant bustle of excitement while the children scurry about to find candles and light them. But the same accident in a crowded theater or hospital operating room, on an airport runway or hazardous assembly line, can result in panic and disaster and death.

As long ago as 1911, when gaslight still burned in most of the theaters along Main Street, the Ohio legislature enacted a bill providing that

> If gas lighting is used in the auditorium and not kept lighted during the entire entertainment or performance, there shall be at least two separate and distinct services where practicable, fed from separate street mains: one service of sufficient capacity to supply emergency lights and the other to supply all other outlets in the building.

Cable ducts have now replaced the gas mains, but the requirement of "two separate and distinct services" remains an essential part of any emergency lighting system. The critical point, however, is not whether these two services are supplied from "separate street mains," but whether the street mains in turn are supplied from two separate sources of energy. For it is obvious that not even a dozen separate and distinct services could produce light in an emergency if they were all supplied from the same shorted transformer.

Two-thirds of the states of the Union do not recognize that this is a problem. In Missouri, for example, where it is a crime to maintain a common bawdyhouse within one hundred yards of a building "ordinarily used as a church," it is *not* a crime to maintain a theater in which no provision is made for emergency lighting. Yet hundreds of persons lost their lives in the "awful darkness" of the Iroquois Theater fire of 1903 because "emergency lights [were] missing." In Delaware it is against the law to employ a minor as a tightrope walker, but it is not against the law to crowd hundreds of children into a circus tent in which no provision is made for emergency lighting of the exitways. Yet it has been ten years since a Municipal Board of Inquiry discovered that "an inadequate understanding of the powers and duties involved in the licensing and inspection of public gatherings" was a contributory cause of the Hartford, Connecticut, circus fire in which two-thirds of the 653 dead and injured were children.

Even in states where matters closely related to emergency lighting are treated by law, emergency lighting itself has been ignored. Colorado, for example, has had a law since 1908 requiring adequate exits in places of public assembly "with proper and sufficient ways and passages leading to and from every such doorway," but no requirement has ever been made that these ways and passages be lighted in the event that a power failure should plunge the hall into darkness. The Delaware Health and Safety Code requires that public buildings should be equipped with fire escapes and outward-opening exterior doors, but no law requires that light be supplied so that these doors may be reached and these fire escapes descended in case the building is blacked out in an emergency. In 1949 legislation was enacted in Missouri that exit lights in a place of public amusement "shall be on a circuit separate from the general house lights." But since this separate circuit was not required to be supplied from a separate source of energy, no real protection is afforded, despite the obvious intention of the law. Similarly, the requirements of the Virginia Fire Safety Regulations for emergency lighting in public buildings are completely nullified by the proviso that "this does not necessarily require a second source of electrical energy for the building."

Mr Ellis is consultant to the Nickel Cadmium Battery Corporation, Easthampton, Mass. His article, "The Hazard of Sudden Darkness," published in the January 1955 issue of Electrical Engineering, *traced the evolution of the National Electrical Code, and the requirements for emergency lighting in the Code. This article, "Light and the Law," calls attention to the status of emergency lighting requirements in building codes and in state laws, and their relation to the National Electrical Code and the Building Exits Code.*

Authoritative information on the subject of emergency lighting is available to state legislators in the so-called national building and safety codes. Many of these codes have already been enacted into law, but the great variance in the adequacy of their emergency lighting requirements demands that they be approached with some caution.

The National Electrical Code,[1] which is a collection of rules for the "safeguarding of persons and of buildings and their contents from hazards arising from the use of electricity," does not in any sense of the word "require" emergency lighting. Article 700 of the Code, entitled "Emergency Systems," explicitly states that the provisions of this article apply only "where such systems or circuits are legally required by Municipal, State, Federal, or other codes, or by any governmental agency having jurisdiction." Adoption of the National Electrical Code by a governmental agency does not, in other words, automatically require the use of an emergency lighting system installed in accordance with the requirement of Article 700 of the National Electrical Code. Of the sixty-odd articles, number 700 is the only one which must be called to life by a separate and specific legal enactment. Thus the State of Florida has adopted the National Electrical Code as a minimum standard for electrical work in school-building construction, but there is still no legal ground in Florida for requiring emergency lighting in school auditoriums.

What the National Electrical Code does include is directions on *how* to install emergency lighting systems. It supplies answers to practical questions such as these:

What must be the capacity of the emergency lighting system?
What kinds of system may be used?
What intensity of light must be provided?
How shall the emergency lighting circuits be wired?
What switches may be used and where must they be installed?

[1] Developed by the National Fire Protection Association and approved as American Standard C1-1942 by the American Standards Association.

Since the Code does not require emergency lighting, it cannot consistently state *where* emergency lighting systems should be installed. What it says, therefore, is that "Emergency systems are generally installed in places of assembly where artificial illumination is required, such as buildings subject to occupancy by large numbers of persons, hotels, theaters, sports arenas, hospitals, and similar institutions." In default of an actual requirement, the National Electrical Code defers the question to another code; it says

See NFPA Building Exits Code for specifications of locations where emergency lighting is considered essential to life safety.

The Building Exits Code[2] states unequivocally that the demands of safety to life require emergency lighting systems in four kinds of building: Places of assembly (with certain exceptions), department stores (of a certain size), hotels (with accommodations for more than 100 persons), and hospitals.

As its title implies, the Building Exits Code, prepared by the Safety to Life Committee of the National Fire Protection Association, contains requirements for the construction and arrangement of fire escapes, width of exitways, alarm systems, and similar matters. Since its only concern is safety to life, the Building Exits Code does not mince words concerning the importance of emergency lighting in general and the importance of a separate source of energy in particular:

Section 1203. The lighting source shall be arranged to assure continued illumination of all exitways in cases of emergency caused by the failure of the principal lighting of the building. Where electric current is the source of the lighting of buildings used for public assembly or congregation, the emergency lighting shall be from *a source independent of that for the general lighting* or shall be controlled by an automatic device which will operate reliably to switch the circuit to *an independent secondary source* in the event of failure of the primary source of current. [Italics not in original.]

[2] Approved as American Standard A9.1-1953 by the American Standards Association.

Adoption of the Building Exits Code by a governmental agency automatically makes emergency lighting "from a source independent of the general building lighting" a legal requirement in the occupancies listed in Section 1203 of the Code. Then, as a kind of extra dividend, Section 1203 also requires that all emergency lighting systems be installed according to the requirements of Article 700 of the National Electrical Code. Adoption of the Building Exits Code, therefore, entails legal enactment of Article 700 of the National Electrical Code.

Taken together, the Building Exits Code and the National Electrical Code afford minimum standards of safety for coping with the hazard of sudden darkness in crowded or hazardous locations. The Building Exits Code tells *where* emergency lighting systems must be installed and the National Electrical Code tells *how* they are to be installed. That these occupancy and installation requirements are minimal requirements which need to be increased in many concrete situations is emphasized in both codes. The National Electrical Code in particular warns that "Assignment of degree of reliability of the . . . emergency supply system depends upon careful evaluation of the variables at each particular installation."

The emergency lighting requirements of the various building codes may be stated very briefly in terms of the two safety codes. The oldest of building codes, the National Building Code of the National Board of Fire Underwriters, makes no reference to emergency lighting at all. It states, in a paragraph of *Section 611. Maintenance,* that the lighting for public buildings and institutional buildings shall be "so arranged and supplied that the interruption of service on any circuit inside the building will not result in total interruption of the required lighting." This, of course, is simply a requirement that the lighting circuits be separately fused.

The Uniform Building Code, published by the Pacific Coast Building Officials Conference, requires emergency lighting (from a separate

source of electrical energy) in a list of occupancies which falls just short of the scope of the Building Exits Code:—in buildings of public assembly with a capacity of more than 300 persons, and any building with a stage. Two more of the codes, the Basic Building Code of the Building Officials Conference of America and the Southern Standard Building Code, which is promulgated by the Southern Building Code Congress, have adopted the requirements of Section 1203 of the Building Exits Code. None of the four "national" building codes, however, refers specifically to the installation requirements of Article 700 of the National Electrical Code.

The federal Hospital Survey and Construction Act of 1946 (P.L. 725, 79th Congress), known popularly as the Hill-Burton Act, provides that one-third to two-thirds of the expense of state hospital construction may be defrayed from the U.S. Treasury. Section 622 of the Act requires the United States Public Health Service to prescribe general standards for hospital construction and equipment. Section 623 requires the participating States to formulate a hospital construction program which embodies the federal standards.

Accordingly, the USPHS issued, early in 1947, an *Appendix A—General Standards of Construction and Equipment* to its regulations for the administration of the Hill-Burton Act. Section III.D.3 of *Appendix A* states that emergency lighting must be supplied for exits, stairs, corridors, and operating and delivery rooms. It also states that the emergency lighting system must be supplied by a second source of energy, "an automatic emergency generator or battery with automatic switch." In order that there might be no confusion on this point, it says:

> Should an emergency service from the street be used [to supply the emergency circuit], it shall be from a generating plant independent of that used for the main electric service.

Appendix A also provides that the emergency lighting system must be installed in accordance with applicable local or state codes or, in the absence of these, in accordance with the provisions of the National Electrical Code. Every state of the Union, plus three territories, the Virgin Islands, and the District of Columbia, have participated in the federal hospital construction program. The requirement of emergency lighting has thus been introduced into the administrative regulations of many states where it was totally unknown before.

The minimum requirements prescribed by the Building Exits Code and the National Electrical Code also provide a standard for measuring the adequacy of existing state law concerning emergency lighting. On this basis, the requirements of only one state, Pennsylvania, exceed the bare minimum requirements. The Pennsylvania regulations, for example, stipulate not only what kinds of building, but even what locations within each kind, must be provided with emergency lighting. The National Electrical Code requires storage battery systems to be of sufficient capacity to maintain the total load of the emergency lighting circuit for one-half hour; the Pennsylvania regulations demand an hour and a half. Similarly, the National Electrical Code requires that generator systems be supplied "with suitable means for starting the prime mover on failure of the normal service," but Pennsylvania adds a time factor: "All engine and turbine systems shall provide illumination not later than fifteen seconds after power failure."

The most significant difference between the National Electrical Code and the Pennsylvania regulations, which are entitled *Construction, Installation and Maintenance*

Backwoods emergency lighting *equipment is sometimes found in a modern office building. Outmoded devices such as these lanterns are the result of equally quaint legislation. The General Laws of Massachusetts, for example, specify that a secondary means of illumination, when required in places of public assembly, may be supplied by electricity, illuminating gas, or "metal-bodied oil lamps."*

of Emergency Lighting Systems, appears in the crucial question of power supply. The National Electrical Code allows the emergency lighting circuit to be supplied from the same source of electrical energy as the normal lighting circuit if the two circuits are wired so that "an occurrence within the building" will not result in simultaneous interruption of both circuits. It is obvious, however, that this system provides no protection against power failures outside the building, which is where one-half to nine-tenths of all power failures occur.[3] Recognizing this fact, the Pennsylvania regulations state emphatically that two separate sources of energy must be present in an emergency lighting system:

> The emergency source of energy for illumination shall be from a device installed within the building, or shall be secured from an independent generating station entirely separate from that which provides the regular or main service. . . . Energy furnished for both services through a single substation, even though the substation may be supplied from separate generating stations, is not acceptable.

Pennsylvania, in short, is the only state whose requirements seem to afford an adequate degree of protection against the hazard of sudden darkness.

At the opposite extreme, there are a half-dozen states with no emergency lighting requirements at all. In between, there are 17 states with emergency lighting regulations equivalent to the occupancy requirements of the Building Exits Code and the installation requirements of the National Electrical Code, and 24 more states whose emergency lighting regulations fail to measure up to the standards of one or the other of the two codes. Included in the latter category are those states whose only emergency lighting requirements are incidental to the state's participation in the federal Hospital Survey and Construction Program. All of these details are shown in Table 1.

[3] S. M. Dean, "Planning for economies yet to be had in system costs," *Edison Electric Institute Bulletin,* **12**, 233-239 (August, 1944) classifies power outages by duration and cause.

The conclusion that may be drawn from Table 1 is not by any means, *How little has been done;* the sum total of state law and administrative regulation bearing upon the problem is actually impressive. The conclusion, on the other hand, is simply, *How much remains to be done.* The best way to do it, as the argument of the preceding paragraphs must indicate, is to provide legal sanction for the requirements of the Building Exits Code.

To this it may be objected that more exacting standards, similar to those of the Pennsylvania regulations, are actually needed. This is true, but the best way to get requirements as good as those of Pennsylvania is not to duplicate each step of the experience which culminated in the drafting of Pennsylvania's emergency lighting code. Such a procedure could result in 48 different emergency lighting codes in 48 states. This would produce the kind of jungle in which log-rolling, discriminatory regulation, special privilege, and other rank political growths luxuriate. Weeds such as these justify Harold Laski's observation that federalism "inhibits the emergence of the necessary standards of uniformity." Yet it is precisely these standards of uniformity that are needed to insure the advantages of mass production for the highest standard of living in the world.

The way to get standards as good as Pennsylvania's, therefore, is to enact the Building Exits Code, which is already an approved American Standard, and then to work through the machinery set up by the American Standards Association to revise and improve the Code itself. Participation in the work of revising an American Standard depends simply on the principle of "substantial interest." Any state which conferred legal status upon the standard might be presumed to have interest in its subsequent evolution.

The way to put the Building Code into effect is to enact legislation

(*a*) requiring "reasonably safe" exit facilities in all buildings occupied by large numbers of people for any purpose whatever,

(*b*) providing that conformity with the Building Exits Code shall be prima facie evidence that such buildings are reasonably safe, and

(*c*) defining the failure to provide reasonably safe exit facilities as a criminal offense.

This method of enactment, called the prima facie method, is the only way to avoid the difficulties and expenses of reprinting each successive edition of the Code in its entirety and at the same time to insure that the benefits of successive revisions of the Code are made available to the public. Any other method of enactment is almost certain to involve serious legal problems on the one hand, or ridiculous historical anomalies on the other.[4]

The legal history of the National Electrical Code indicates both of these points very clearly. The Supreme Court of Kansas, for example, has ruled that "A statute requiring owners of theaters to make all wiring conform to the 'National Electrical Code' is an attempt to delegate the power of this state and is therefore unconstitutional."[5] And an attorney general in the State of Ohio found himself forced to conclude in 1938 that the provisions of the 1923 edition of the National Electrical Code were mandatory even though such provisions were obsolete, even though many materials approved in the 1923 edition were no longer manufactured, and even though no copy of the 1923 edition had been printed for 12 and a half years.[6]

In some states it may be possible to provide legal sanction for the Building Exits Code without enacting any new legislation. In Arkansas, for example, the Commissioner of Labor is empowered to make "reasonable rules for the construction, repair, and maintenance of places of

[4] Ralstone R. Irvine, "The Constitutional and Legal Problems Surrounding the Use of National Codes and Standards by States and Municipalities," *Nationally Recognized Standards in State Laws and Local Ordinances,* a report by Committee Z56 on Model Laws and Ordinances (American Standards Association, Incorporated, New York), 1949.

[5] *The State vs. Crawford, 104* K. 141, 144; 177 P. 360.

[6] 1938 O.A.G. No. 3363.

employment, places of public assembly, and public buildings, as shall render them safe." Adoption of the Building Exits Code as an administrative regulation would clearly fall within the exercise of this power. In Oregon a similar power has been delegated to the State Fire Marshal. But in states where this enabling legislation has not been passed, enactment of the Code by the prima facie method is the best way to avoid the difficulties described in the preceding paragraph. It is no more difficult legislatively to require reasonably safe exit facilities than it is to enable an administrative agency to require reasonably safe exit facilities.

The requirement of "reasonably safe" construction is already well established in common law. The difficulty, of course, lies in determining exactly what is meant by "reasonable safety." This is done in common law by defining reasonable safety as "a condition such as ordinary care and diligence will secure." "Ordinary care," in turn, is defined as the care which a man of ordinary prudence and caution would exert in circumstances similar to those in question and in the like situation. The man of ordinary prudence, of course, is the average man acting according to the normal usages of his business. And the failure to do what the man of ordinary prudence would do under similar circumstances turns out to be negligence.

The Supreme Court of the United States, fortunately, has confirmed the right of the state to break through this closed circle and impose a higher degree of duty by legislative enactment. "Reasonably safe," in other words, is a relative measure of duty which can be made absolute by statute. To provide a practical means of discovering when this absolute duty has been complied with, the statute may also provide that compliance with the Building Exits Code will supply presumptive evidence of compliance with the law. Under these circumstances, compliance with the Code will bebecome a practical necessity even though it is not required by law. It will simply be cheaper for the property owner to comply with the Building Exits Code than it will be for him to supply other evidence that he has fulfilled the absolute measure of duty imposed upon him by the law.

Here it is important to emphasize that it is the duty and not the safety that is absolute. It is wholly reasonable that the duty in question should be absolute and unchanging. For there can be no partial exercise of ordinary care. Either it exists or it is wholly lacking. But not even the exercise of ordinary care will guarantee absolute safety. It is a maxim in common law that absolute safety is unattainable and that employers, or in the present case, property owners, are not insurers. Since it is incompatible with any human activity, absolute safety is not even desirable.

What *is* desirable is normal care and if the legal fiction of "the prudent man" may be set aside for the moment, "ordinary care" can be seen as the condition or quality of never trusting to mere chance, of exercising foresight to anticipate danger. In the case of emergency lighting for crowded or hazardous locations, the quality of foresight can best be demonstrated by meeting the requirements of the Building Exits Code. The power of the state to promote the public health, morals, safety, quiet, convenience, and prosperity of the citizen is an ancient one reflected in the maxim, *salus populi suprema lex*,—the welfare of the people is the overriding consideration. This principle was invoked in a much-cited case[7] where the owner of a building refused to expend his resources to comply with newly enacted building laws. He contended that he had derived a kind of inherent or vested right from the fact that he had complied with the laws existing at the time the building was erected. The court found this argument without merit, however, and concluded as follows:

> There is no such thing as an inherent or vested right to imperil the health or impair the safety of the community. But to be protected against such impairment or imperilment is the universally recognized right of the community in all civilized governments; a protection which the government not only has a right to vouchsafe to the citizens, but which it is its duty to extend in the exercise of its police power. . . . The people have a right to the safest method that can be found and determined by the Legislature.

So far as emergency lighting is concerned, this "safest method" lies in the enactment of the Building Exits Code.

TABLE 1

	EMERGENCY LIGHTING REQUIREMENTS	STATE
ABOVE	the minimal standards of the Building Exits Code and the National Electrical Code.	Pennsylvania
EQUAL TO	the minimal standards of the Building Exits Code and the National Electrical Code.	Connecticut, Georgia, Illinois, Indiana, Kentucky, Louisiana, Massachusetts, Minnesota, New Hampshire, New York, North Dakota, Ohio, Oregon, Washington, Wisconsin.
BELOW	the minimal standards of the Building Exits Code and the National Electrical Code.	Alabama, Arkansas, California, Idaho, Maine, Maryland, Michigan, Missouri, New Jersey,* Rhode Island,* South Dakota, Virginia, West Virginia.
	No requirements beyond those of the United States Public Health Service (or the equivalent).	Arizona, Colorado, Iowa, Kansas, Mississippi, Montana, Nevada, Oklahoma, South Carolina, Tennessee, Vermont, Wyoming.
	No requirements	Delaware, Florida, Nebraska, New Mexico, North Carolina, Texas, Utah.*

* Requirements in process of revision.

[7] *Seattle vs. Hinckley*, 40 Wash. 468; 82 P. 747; 2 L.R.A. (N.S.) 398.

How Methods of Compiling Accident Statistics Have Been Changed

by H. B. DUFFUS

ON January 1, 1955 the revised American Standard—Method of Recording and Measuring Work Injury Experience—went into effect. The original standard came into being in 1937 and was revised in 1945. This new revision was approved December 15, 1954, and is the final achievement of several subcommittees that have worked diligently on the revision over a five-year period.

While the original standard was in effect, the problem of determining the reportability of a work injury was most simple. If the Workmen's Compensation Board ruled that an injury was compensable, then it was counted against the plant's injury experience. While this provided a simple measure of reportability, it failed to provide a uniform measure of national comparability. In the interests of providing a national standard for comparison of work injuries the 1945 revision of the standard became independent of state and federal requirements for reporting injuries for purposes of Workmen's Compensation and rulings as to disability by Workmen's Compensation agencies. This necessitated inclusion in the standard of a series of definitions of what constituted a work injury and its degree of reportability. Over the years there has been made evident a need for additional rulings to maintain the standard as a national measure of comparability. In this recent revision the committee has recognized this need and has made changes accordingly.

To assist in the interpretation of the rulings in the standard, provision was made back in 1945 for an interpretation committee. Since the inception of this committee, it has handled over 300 requests for interpretation of the standard relative to specific injuries. The information gained from the questions submitted provided a wealth of material for the present revision. From the number of cases submitted for decision it was evident that there was need for a better understanding of the wording of the standard. To correct this the first section of the new standard contains a set of clean-cut definitions of the several elements of the standard.

To further clarify the standard an appendix has been added. This appendix, while not a part of the standard, as such, is provided to further facilitate the use of the standard. Examples of interpretations are given for those items on which the person using the standard may be in doubt.

Certain changes were made during the revision to carry through more completely the intent of the standard. For example, the type of hernias to be excluded from the record and the time charges for those to be included was not clear. It is now specified that only inguinal hernias are to be considered for possible exclusion from the record and that all hernias that are repaired will be classified as temporary total disabilities and the actual days lost used in place of the 50 days charged under the old edition of the standard.

One of the more frequent types of injuries referred to the committee for ruling on reportability was that of back injuries. The new standard specified that back injuries shall be considered work injuries only if there is a clear record of the accident or incident and that in the opinion of the authorized physician the injury could have arisen out of the accident or incident. It is expected that this definition of a work-connected back injury will permit a more uniform measure of reportability of back injuries. It is not to be construed as a medium for the exclusion of all back injury cases from the injury records.

One of the most troublesome problems in the past has been the reportability of injuries resulting from external events of such proportion and character as to be beyond the control of the employer. The revision excludes injuries that result directly from catastrophies such as tornadoes, twisters, hurricanes, earthquakes, floods, conflagrations, or explosions originating outside of employment. There are some modifications to this—for example, injuries resulting from activities necessitated by such events.

There was some question on how injuries involving loss of hearing should be charged. This is clarified by stating that only complete industrial loss of hearing will be classified as permanent partial disability with a 600 day charge for one ear and 3000 days for loss in both ears, in one accident.

The computation of time charges for finger or toe accidents involving several members was rather difficult to carry out. This has been simpli-

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Mr Duffus is administrator, Accident Prevention, Westinghouse Electric Corporation. He has been chairman of Sectional Committee Z16 on Standardization of Methods of Compiling and Recording Accident Statistics since 1945.

fied by applying a charge to each digit and then through the medium of a hand and foot chart the total loss can be readily computed.

To cover more equitably the types of injuries, or suspected injuries, that can be hospitalized for observation, the standard has been reworded to specify such accidents as a blow on the head or abdomen, or inhalation of harmful gases. It does not specify these three exclusively.

The disabling injury severity rate is now to be computed on the same basis as the frequency rate, that is, on the basis of a million man-hours of exposure. Back in 1920 when the original measures first came into being, the severity rates were in the order of one and two digits. Continued reduction in the severity rate has reached a point where over 90 percent of all plants reporting to the National Safety Council give severity rates of less than a whole number, and in many cases to three places behind the decimal point. This, plus many requests for a more uniform measure, influenced the change.

To round out the evaluation of injury experience a third measure has been added—the average days charged per disabling injury. This is determined by dividing the total number of days charged by the total number of disabling injuries.

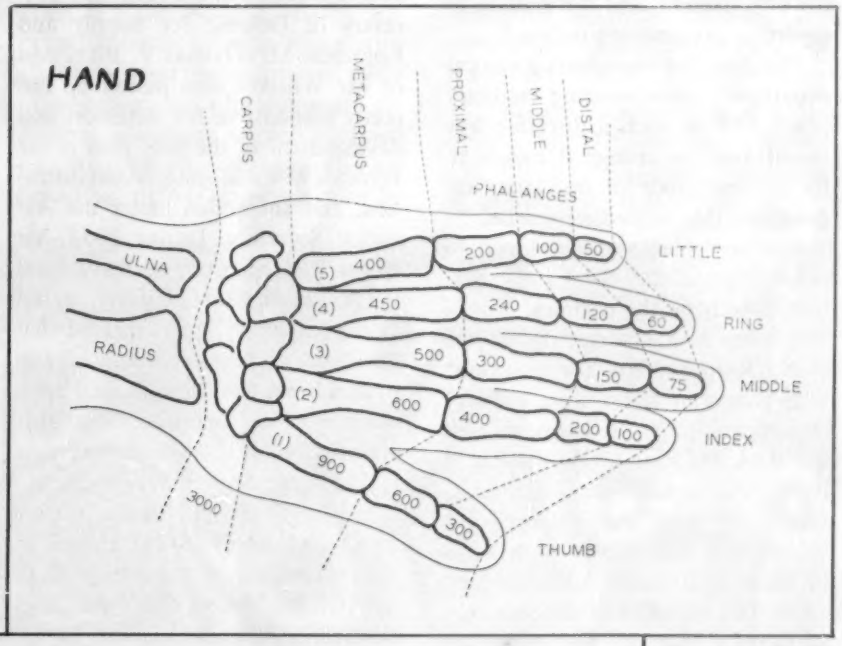
There are other minor changes contained in the newly revised standard, generally for the purpose of providing greater clarification.

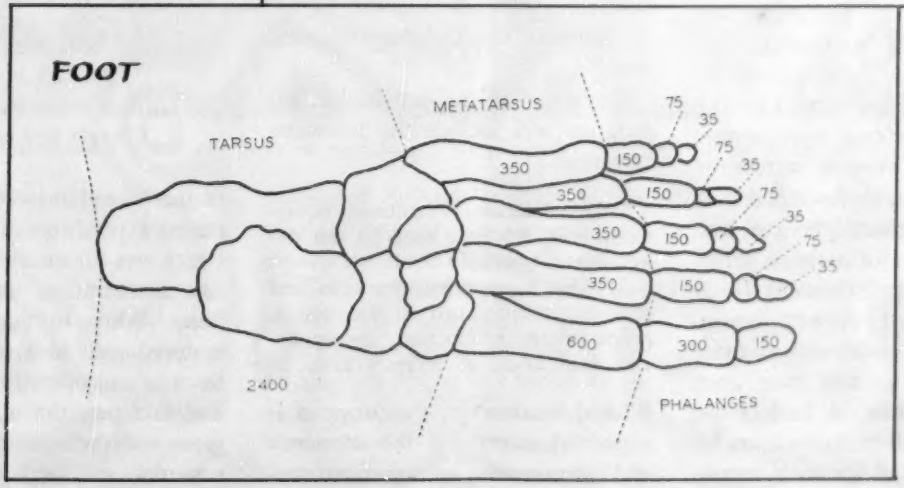
In the revision of the standard the groups of special committees worked diligently over a period of five years to provide a standard that will meet today's needs for a uniform measure of recording and measuring work injuries. As with all other standards its usefulness will be determined by the degree to which all industrial groups accept it and use it as a national standard of comparability.

Copies of American Standard Method of Recording and Measuring Work Injury Experience, Z16.1-1954, can be obtained from the American Standards Association, 70 E. 45 Street, New York 17, N.Y., at 50 cents each. Quantity prices are available on request.

Chart of Scheduled Charges for Hand and Foot

This chart *shows the number of days to be charged for amputation of parts of a hand or foot in recording accidents. The chart appears in the revised edition of the American Standard Method of Recording and Measuring Work Injury Experience, Z16.1-1954.*





The New Defense Standardization Program

by CHARLES J. EIWEN

On 15 October 1954, the first step in the establishment of a comprehensive standardization program was taken by the Department of Defense. After months of effort and coordination, Department of Defense Directive 4120.3 was promulgated by the Secretary of Defense, Mr Charles E. Wilson. Included in the directive are the principles and policies under which the defense standardization program is to be prosecuted. The scope, purpose, basic objective, the plan of attack, the organization, and the method of reporting progress are outlined.

The directive represents a radical departure from existing military practice. Why such a directive was issued and the change it makes to the present mode of operation are questions that immediately arise.

The new plan was developed to place responsibility for standardization directly on the technical groups which are best qualified to do the work. Responsibility for a specific supply area is given to a military department—that department best qualified to do the job by reason of its mission, its technical staff, and its record of past performance. Included with this plan is the transfer of those operational functions performed by the office of the Secretary of Defense from the Secretary's office to the military departments.

Previous to this development, no detailed program had existed for the promotion of defense standardization. Individual projects were proposed, initiated, and developed as a need arose. In general, the goal was the establishment of a single series of specifications and standards which would best meet current needs. While it is still necessary to meet current needs, the new plan goes considerably further. A basic tenet is that an over-all program must be developed in detail for each supply area. This should have at least two positive results:

1. Enable an emphasis to be placed on those areas which are most essential and most susceptible to benefit from standardization actions;
2. Provide a broader forward look before action is initiated. Further, it will provide a means of establishing closer budget requirements with a nicer allocation of funds to produce maximum benefit.

In the Department of Defense, general responsibility for standardization is vested in the Assistant Secretary of Defense for Supply and Logistics, Mr Thomas P. Pike, one of Mr Wilson's nine assistants. Directly responsible for initiation and development of the new plan is the Director of Cataloging, Standardization, and Inspection under the Assistant Secretary. During 1954, Mr Roger F. Hepenstal, on leave from the American Can Company, served in this capacity. It is expected that Mr Roger E. Gay, president of The Bristol Brass Corporation, and president of the American Standards Association, will serve in this post in 1955. Mr Nathan W. Brodsky, a career civil servant, is the deputy director. Immediately in charge of the standardization program is Captain C. R. Watts, USN, the Staff Director for Standardization. Figure 1 illustrates the Defense organization.

Coverage of the standardization program will include the following categories:

1. The materials, components, equipment, and processes used by the Army, Navy, and Air Force.
2. The engineering practices and procedures concerned in the design, procurement, production, inspection, and application of military items.

With this coverage, the program is aimed at improving the efficiency and effectiveness of logistical support and operational readiness, conserving material resources and manpower, and insuring the economical procurement of necessary supplies.

The importance of the standardization effort can best be judged in relation to the military budget. In the 1955 budget, almost one-third of the 45 billions of dollars of estimated expenditures for national security was for aircraft, tanks, weapons, ammunition, and other major items. When to this is added the material costs involved in the maintenance and operation of equipment and facilities, the military aid program and the military public works program, the total exceeds 15 bil-

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The opinions expressed are the personal opinions of the author and do not necessarily reflect the official position of the U.S. Department of Defense.

Thomas P. Pike
Assistant Secretary of Defense
(Supply and Logistics)

lions of dollars. The word astronomical is appropriate when such figures are discussed. Any fractional savings resulting from the standardization effort will be a substantial sum.

Recently, the General Services Administration of the U.S. Government reported that the number of kinds of mimeograph paper used by government activities had been reduced from 172 to 17. Normally, mimeograph paper might not be considered an important item of purchase. But because of the quantities used by the government, it was estimated by GSA that a saving of a million dollars would result from the standardization. Cases like this bring into focus the extent of benefits which may be derived from relatively minor standardization actions when the volume involved is very great. Added to this monetary saving, as far as Defense items are concerned, is the increase in military training and operational efficiency that results when the types, sizes, and kinds of items can be reduced.

What is the trend of military expenditures in the future? From present indications, it appears that military preparations as regards manpower will be based on a reduced active force and a substantial reserve. This plan has evolved as a result of the emphasis on providing a strong military position which can be maintained over an extended period of what the President has aptly called an uneasy peace. In order that prompt action may be taken in an emergency, this should mean that ample stocks of modern military equipment must be available. Reserve forces can be called up in a relatively short time. Modern military equipment is not produced or procured as readily. In order that effective use can be made of reserve forces and a formidable general defense be thrown up rapidly, suitable equipment must be available. In addition, proper training of reserves is dependent on their having modern training equipment for use. With these considerations in mind, it would appear from present indications that procurement of military equipment will remain at a high level in the immediate future.

Need for prudence and care in the purchase of material is evident; thus a sound standardization program is a necessity. The new approach includes adherence to a principle which has been expressed many times before, but which is worth repeating. Standards are not obtained by extracting an average of all proposals submitted. Standards must be developed through careful analysis of a subject, for they represent not an average but the most proper solution — a solution which has been proven and which should serve for an extended period of time if the existing conditions and forecasts remain constant and true. As conditions related to the standard change, the standard must change, and at substantially the same rate. Occasionally people will say that standardization is a deterrent to progress because they visualize a standard as fixed and immovable. Standardization is dynamic and an aid to progress. Were is not for standardization, the industrial empire that we have today would not exist. No one, for example, would say that the American automobile industry is not progressive. Yet if it were not for the standardization which has been applied in this industry, the tremendous output we are familiar with would not be practicable. It is the intent of the Defense Department to produce dynamic, progressive standardization through the new program.

Under the new plan, assignments will be made to the Department of the Army, the Navy, and Air Force, who in turn will delegate phases to individual services, bureaus, and commands. Assignments will be made for:

1. Supply items, by classes in the Federal Supply Classification System.

2. General engineering standards, by practices, processes, codes, etc.

U.S. Air Force Photo

Airborne radar *places emphasis on problems of weight, size, and reliability of electronic equipment*

As an example of how this plan will operate, the following might be cited. It is proposed that Class 5305 in the Federal Supply Classification covering bolts, studs, and screws be assigned to the Department of the Army. In turn it might be expected that this class would be assigned to the Ordnance Corps within the Army. Now the military de-

partments use and specify many different types of bolts, studs, and screws. No one service and no one department is presently fully cognizant of all the different types and uses to which military activities put these items. What the assignment means is that the Department of the Army, or in turn the Ordnance Corps, will be responsible for surveying this field, for examining existing related military, federal, technical society, and commercial specifications and standards, for determining what items its activities and all other Defense activities are using. When this information and any other pertinent information has been collected, it will be incumbent on the Army to determine whether standardization is practicable and if so, to plan a detailed program covering what it will do, what it expects the other military departments to do, and a schedule of accomplishment. An estimate of the benefits to be derived and the costs involved will be made.

Two points should be noted. The first is that while the assignment is made to one department and thence to one service, the results to be achieved will represent a cooperative effort. All interested activities will be involved. It is realized that proper specifications and standards result from consideration of the technical factors involved, the experience of all activities concerned, and adequate analysis of pertinent factual information. Secondly, an evaluation of the benefits to be derived from the standardization project will be made before the project is undertaken. These benefits will be balanced against the cost of completing the project. The initiation and priority of the project will be determined accordingly. Figure 2 illustrates the general plan of operation for defense standardization.

All individual programs developed by the military departments will be submitted to the Standardization Division before initiation. A review will be made to establish that the proposal is in conformance with established policies, that the justification is proper, that the proposed schedule is such that the work will mesh properly with other projects, and that there is general concurrence by all three military departments. When an individual program is concurred in, it will be the responsibility of the department, and in turn of the service receiving the assignment to conduct the program according to the planned schedule.

The directive does not attempt to establish a single fixed plan for

Evacuation of Tachen Island. *In evacuation or attack, the variety of military items is critical.*

U.S. Army Photo

all classes, but rather provides certain flexibility. For example, in the case of class 5960 of the Federal Supply Classification covering electron tubes, transistors, and rectifying crystals, it is proposed that the responsibility be assigned to the Department of the Navy. In this field, the Armed Services Electron

Captain C. R. Watts, USN
Staff Director for Standardization

Tube Committee composed of technical representatives from the three military departments has functioned and is functioning very effectively. It is unlikely that the committee's mode of operation will be changed. What the assignment will mean is that an activity, in this case a Navy bureau, which is a basic part of the Defense organization and which is intimately engaged in the development, procurement, and use of the devices, will have the responsibility for fostering maximum practicable standardization in this field. This can be accomplished by monitoring the work of the technical committee.

In addition to direct monetary benefits, benefits such as the following will be considered in the evaluation of programs:

1. The extent to which the determination of logistical requirements will be facilitated.
2. The extent to which procurement is facilitated through:
   (*a*) Consolidation of purchasing requirements.
   (*b*) Increased sources of supply.
   (*c*) Establishment of appropriate performance levels.
   (*d*) Improvement in interchangeability of parts.
   (*e*) Improvement in producibility.
3. The extent to which field operations and direct logistical support are improved.
4. The extent to which the supply system is assisted through:
   (*a*) Reduction of the types and sizes of items.
   (*b*) Increased use of common parts.
5. The extent to which engineering and technical activities are aided by a uniform and simplified engineering language and practice.
6. The extent to which natural resources and critical materials are conserved.

It is of interest to note that the following cases are exempted from the provisions of the directive relating to the development of specifications:

1. Purchases incident to research and development.
2. Purchases of items for test or evaluation.
3. Purchases of laboratory test equipment for use by government laboratories.
4. Purchases of items for authorized resale except military clothing.
5. Purchases of items in an amount not to exceed $1000.00.
6. Purchases of one-time procurement items.
7. Purchases of items for which it is impracticable or uneconomical to prepare a specification.

It has been found to be generally true that the development of coordinated specifications in these cases is not economical.

An important provision in the directive is the statement that "coordinated Federal and military specifications are mandatory on all activities of the Department of Defense for use in procurement either by formal advertising or negotiation, and, as appropriate, in design." Since the inception of the development of joint specifications and standards for use in the three military departments, question has been raised as to the extent of their applicability. In some cases, Defense activities have continued to employ individual activity documents which duplicated joint documents. It is now indicated positively that there will be only one formal series of military specifications and standards. Individual specifications which have been developed by the military departments, Navy bureaus, Army services, and Air Force commands are being converted. By 1, July 1955, all such specifications will be converted to the Federal or military series. In like manner, existing standards prepared by Defense activities but not in the Federal or military series will be converted under a planned program designed to minimize cost and permit an orderly transition.

Of particular interest to nongovernmental activities is the encouragement given by the directive to the use of commercial items. The directive requires that commercial items will be adopted by Defense activities without modification unless they will not satisfy military requirements. Granted that the element of individual judgment enters the selection, official emphasis is placed on use of commercial equipment and parts "as is." Defense activities must show that commercial items produced for a particular use are not suitable for military use when the same end result is desired.

Coupled with the encouragement of the use of commercial items are two provisions in the directive which relate directly to industry:

1. The first requires that nationally recognized industry and technical society standards and specifications shall be used to the maximum extent practicable in the development and design of military equipment and in the preparation of military standards and specifications. Recently, the extent of participation of Defense personnel in the activities of technical societies, associations, and groups was clarified by Department of Defense Directive 5500.2 dated 13 September 1954. Technical representatives of the Department are permitted to participate and vote on the technical phases of the work where the interest of the Department is involved. Active participation should produce a better understanding of the position of each side, and the wider use of industry standards and specifications envisaged by the Defense standardization plan.

2. The second provision requires

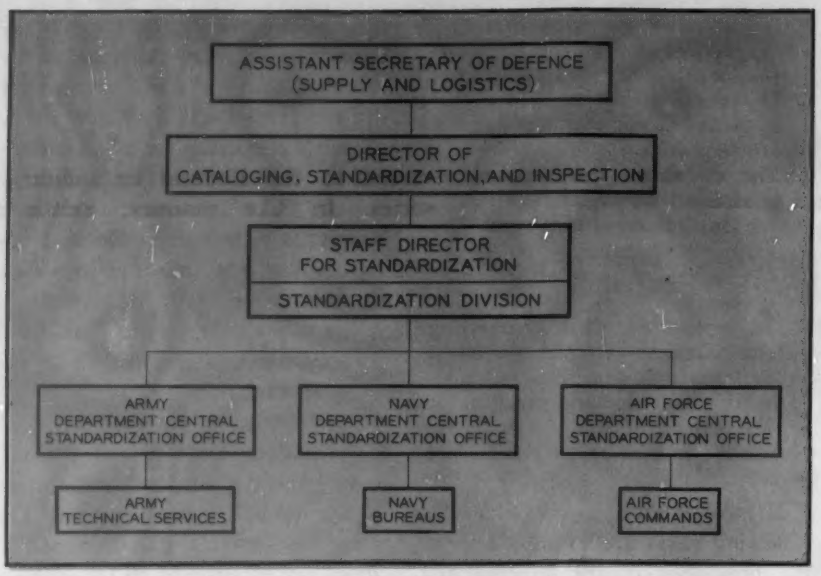


Figure 1. *Standards Organization in U.S. Department of Defense*

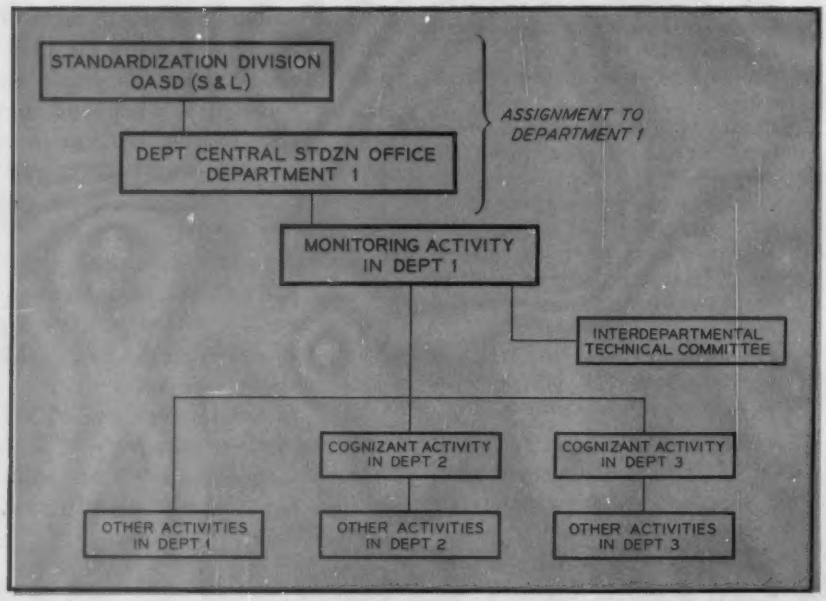


Figure 2. *General Plan of Standardization Operation*

that adequate coordination with industry be effected during the development of specifications and standards. It is realized that cooperation in the development of these documents will be of benefit to the government and industry. It will be the intent that a canvass of a representative cross section of industry shall be made, including a proper distribution by geography and by size of business and including trade association members and non-members, technical societies, and other standardization organizations, as appropriate. Naturally there will be occasions when coordination will not be as effective as might be desired because of the urgency or the quantity of work. In these cases, it is hoped that industry will point out discrepancies when the standard or specification is issued so that prompt action may be taken to review the document.

What is the role of the office of the Secretary of Defense in the program? At the outset, the development of the plan and associated procedures, the preparation, coordination, and issuance of necessary directives and instructions, the assignment of classes of items and types of practices, the correction of initial difficulties, and the dissemination of information concerning the plan are all functions which must be performed by the central authority. Establishing and policing schedules for completion of the various initial phases of the program must be performed. When the fundamentals of the program are established and assignments have been completed, the individual plans submitted by the departments must be reviewed, analyzed, and correlated. In particular, the reasons specific actions are proposed must be examined to establish as fact that the defense effort now or in the future will benefit from the proposed course. Budget estimates submitted by the departments must be reviewed. As plans are put into operation, review of the progress will be a function of the departmental standardization offices, but general review must be made to see that correlated or dependent projects move together. Differences among the military departments in any phase of the program which cannot be reconciled by the assigned department will be referred to the Standardization Division for resolution. General review must be made to establish that planned coordination with industry is sufficient and effective. Contact with engineering and technical societies and associations will be maintained to foster a two-way flow of information and to explain Defense standardization policies. It is incumbent on the Standardization Division to make certain that pertinent information concerning the policies and program and its progress be disseminated both verbally and in writing to all interested activities. Reports to Congress must be prepared periodically. These will be the duties of the Secretary's office.

Since the passage by Congress of the National Security Act of 1947 which established the pattern for the military establishment, the Defense standardization program has been one of the more productive moves toward the authoritative coordination and unified direction of the defense effort that the Congress sought. A single military specification series has provided a common basis for military procurement and a single

military standards series has provided a common technical language and promoted common engineering practices. The standardization effort has reduced the variety of military items and has fostered general use of common items. Much of this accomplishment was achieved while progress toward coordination in other spheres was being made slowly. However, when the ramifications of the defense effort are examined, it is evident that much remains in the field of standardization to be accomplished in the future. A critical analysis of what has been done, a plan for what should be done, and prompt execution of the plan—this by the activity best qualified to make the analysis and prepare the plan—will compose the Defense standardization program. It is designed to promote more economical operation through adoption of proven engineering practices for use by all military activities and through the reduction of the number of military items while selecting and retaining those most useful and effective.

Your Nominations are Requested

ALL members of the American Standards Association are invited to send in nominations for the 1955 recipients of the Howard Coonley Medal and the Standards Medal. Nominations should be in the hands of the Managing Director of the Association before June 30, 1955.

The Howard Coonley Medal is awarded each year to an executive who by his practice and preachments has furthered the national economy through voluntary standardization. Recipients have been The Honorable Herbert Hoover, Mr Howard Coonley, Mr William Batt, Senator Ralph E. Flanders, and Mr Thomas D. Jolly.

This gold medal was established by the ASA Board of Directors in 1950 through the support of certain industrial organizations. It was named in honor of Mr Coonley, who during his 22 years as member of ASA's Board of Directors had become recognized both nationally and internationally for his leadership in standardization.

The Standards Medal, also a gold medal, is an award to an individual who has shown leadership in the development and application of voluntary standards. It was established in 1951, using Association funds. It has been awarded to such well-known leaders in standardization as Frank O. Hoagland, Perry L. Houser, the late Dr P. G. Agnew, and Dr John Gaillard.

Nominations should be submitted in quadruplicate on plain paper without indication as to the source of the nomination. Each nomination should be accompanied by a letter of transmittal.

In order to provide complete and comparable data, forms can be obtained from ASA for filing nominations.

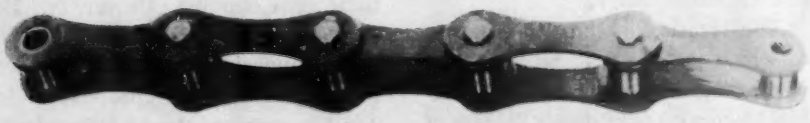
New Standards on Double Pitch Steel Roller Chains

For many years, roller chain manufacturers have furnished, for specific installations, an economical, precision power transmission steel chain known as Double - Pitch Power Transmission Roller Chain. This double-pitch chain differs from the conventional transmission roller chain, described in American Standard B29.1-1950, only in the pitch of the chain. It is made in six sizes ranging from 1-inch pitch up to and including 3-inch pitch. Recently a standard was developed for this double - pitch power transmission roller chain and its sprockets. This new standard is designated as American Standard B29.3-1954. It provides such design information as chain pitch, roller diameter, chain width, limiting dimensions to assure interchangeability of links as produced by different manufacturers, maximum recommended permissive rotative speed of sprockets, horsepower rating tables for the various chains in the series, and complete information concerning the design and manufacture of sprockets for operation with these chains.

Engineers and others concerned with the design of equipment will find this standard useful for power transmission drive applications in the moderate speed, moderate load range.

A parallel series of precision steel chain known as Double-Pitch Conveyor Chain also has been standardized in seven sizes ranging from 1-inch pitch up to and including 4-inch pitch. These chains are of the same general construction as the double - pitch power transmission series with the exception of the contour of the link plates and the use, in some cases, of large diameter rollers, and attachment link plates, or extended chain pins, or both, to permit the attachment of users' flights or other parts so as to adapt the chain for conveying, elevating, or timing operations.

This series of chain is described in the recently published standard entitled Double - Pitch Conveyor Roller Chains, Attachments, and



Roller chain—*a series of alternately assembled roller links and pin links in which the pins articulate inside bushings and rollers are free to turn on bushings.*

Sprockets and designated as American Standard B29.4-1954. This standard presents information on chain pitch, diameters of rollers of the standard-roller series and the large-roller series, width, dimensions of attachment components of these chains, allowable working loads, maximum speeds, and complete information on the design of sprockets, including data on the selection of tools for cutting the teeth in the sprockets.

American Standard B29.4-1954 will be of interest primarily to persons concerned with the design of elevating and conveying mechanisms.

Both these new standards were developed by a technical committee of the Association of Roller and Silent Chain Manufacturers and have been reviewed by the Sectional Committee on Standardization of Transmission Chains and Sprocket Teeth, B29. This committee is sponsored by the American Society of Mechanical Engineers and the Society of Automotive Engineers.

Copies of American Standard B29.3 - 1954 (SAE SP - 90) and American Standard B29.4 - 1954 (SAE SP-91) can be obtained from ASA at $2.00 each.

Other Chain Standards

In addition to the recently published American Standards on double-pitch chains and sprockets, a number of other American Standards covering chains are available.

American Standard Transmission Roller Chains and Sprocket Teeth, B29.1-1950 (SAE SP-69), is a 1950 revision of an earlier standard proposed by the Technical Committee of the Association of Roller and Silent Chain Manufacturers, approved by Sectional Committee B29 and by the Society of Automotive Engineers and the American Society of Mechanical Engineers, sponsors.

American Standard Inverted Tooth (Silent) Chains and Sprocket Teeth, B29.2-1950 (SAE SP-68) includes tables for sprocket design and supplementary information on sprocket tooth cutters.

American Standard Attachments for Transmission Roller Chains, B29.5-1954 (SAE SP-92) covers the diameter and location of the holes in the attachment link plates, the height above the pitch line of the top of the bent attachment link plates, and the diameter and length of extension of the extended pins. Purpose is interchangeability.

Steel Detachable Link Chain and Attachments, American Standard B29.6-1954 (SAE SP-93) establishes dimensions that will provide interchangeability of the chains in use for power transmission and conveyors on manure spreaders, corn pickers, planters, hay rakes, elevators, potato diggers, and other agricultural machines. The work was done by a subcommittee of ASA Sectional Committee B29 on recommendation of the agricultural equipment manufacturers.

Malleable Iron Detachable Link Chain and Attachments, American Standard B29.7-1954 (SAE SP-94) was prepared by a subcommittee of ASA Sectional Committee B29, including members from the agricultural implement industry and the malleable detachable sprocket chain industry. The standard includes general information on cast detachable chains, and general dimensions of plain chains and of attachments.

IT COULD BE YOU

A mock trial entitled "It Could Be You" will be the feature of a session on hearing in industry during the meeting of the American Medical Association on June 9 at Atlantic City. The trial will be directed by Dr Howard House of Los Angeles. It is being given under the auspices of the Subcommittee on Noise in Industry of the Committee on Conservation of Hearing, American Academy of Ophthalmology and Otolaryngology.

The Hearing in Industry Session, of which the trial will be a feature, will be a joint meeting of the American Medical Association's Section of Otolaryngology and Section on Preventive and Industrial Medicine and Public Health.

GAILLARD SEMINAR

Nineteen men representing seventeen organizations attended Dr John Gaillard's private seminar on Industrial Standardization held in New York City, January 24 through 28, 1955. The organizations are:

American Standards Association
* Arabian American Oil Co
* Bristol Brass Corp
Bureau of Ships, Navy Dept
* Canadian Industries Ltd
* Carbide and Carbon Chemicals Co
Carrier Corp
* Clark Equipment Co
Koppers Co, Inc
* Linde Air Products Co
* Link Aviation, Inc
* Lummus Co
P. R. Mallory & Co, Inc
Raytheon Manufacturing Co
* Standard Electric Time Co
Sylvania Electric Products Inc
Texas Instruments Inc

Nine of these organizations (marked by an asterisk) were represented for the first time.

The Gaillard Seminars, held twice a year since 1947, have so far been attended by 272 representatives from 150 organizations, including American and Canadian companies; trade associations; the ASA and four foreign national standards bodies; the U.S. Departments of the Army, Navy, and Air Force; the National Bureau of Standards; the Massachusetts Institute of Technology; the Universities of California and Illinois; and Mellon Institute.

The next five-day Gaillard Seminar will be held from June 13 through 17, 1955, in the Engineering Societies Building, New York City. The major subjects to be discussed are the organization and procedure of standardization work in an individual company, and the principles and technique of formulating standard specifications. Advance registrations may be made by writing Dr Gaillard at 400 West 118 Street, New York 27, N. Y.

Formerly a member of the ASA staff and a lecturer in standardization at Columbia University, Dr Gaillard is now a private management counsel specializing in advice on standardization problems. In 1954 he received the ASA Standards Medal awarded annually "for leadership in the development and application of voluntary standards."

The 1955
NATIONAL PLUMBING CODE

A uniform code for plumbing has now been approved as the country's first true national plumbing standard. After more than 20 years of development, the code is designed to modernize existing practices and to coordinate the work of plumbing equipment manufacturers, architects, contractors, municipal law makers, building officials, and others.

The American Society of Mechanical Engineers, with the cosponsorship of the American Public Health Association, provided the administrative leadership in obtaining approval of the code as the American Standard National Plumbing Code, A40.8-1955.[1]

According to the sponsors, the code may be used by architects and contractors in the design and installation of plumbing equipment, by plumbing equipment manufacturers in the design of their products, and by states and cities as a basis for regulations and ordinances.

The new code embodies a report by the National Plumbing Code Coordinating Committee, which began work in 1949 to develop a nationally acceptable uniform code from many conflicting codes. Chairman of the Coordinating Committee was F. M. Dawson, dean of the College of Engineering, State University of Iowa.

If the entire system of water supply and waste removal is to work properly, Dean Dawson has explained,[2] a plumbing code must contain correct engineering provisions (1) to supply pure water any time of day or night for homes, factories, and public buildings; (2) to provide standard plumbing fixtures in buildings; (3) to remove liquid waste from buildings with the least difficulty.

"Plumbing in the United States, as we know it, is relatively new," Dean Dawson said. "Not until about 1880 was the principle of the venting system in drainage pipes known."

In connection with venting, the standard provides "The drainage system shall be provided with a system of vent piping which will permit the admission or emission of air so that under no circumstances of normal or intended use shall the seal of any fixture trap be subjected to a pressure differential of more than 1 inch of water."

"That takes some doing," Dean Dawson explained. "That pressure must be maintained if the seals in the U-traps under the fixture are to be kept full of water, thus maintaining a distinct barrier between the sewer and the house or shop or factory." The present edition of the standard recommends a simple type of venting that eliminates unnecessary expense but assures protection against backflow of waste materials into the pure water supply.

"We are engaged in testing and in laboratory attempts to find out what is scientifically correct," Dean Dawson explained. "We are not finished yet, as a matter of fact, nor will we be finished for many years to come. We have many people investigating this problem, but time is needed to see how the experiments work out.

"The results cannot be determined by laboratory test alone. Experience in practice is also necessary. In certain older cities where there are uneven, small, poorly laid sewers, special consideration may be required. This is particularly true on the seaboard. Here we have a difficult problem that does not exist in inland cities, that is, the rise and fall of the tides, which varies the level of the water surface in the sewers."

Not only is the standard intended to provide a supply of pure and wholesome water for all premises intended for human habitation and use, as defined in its basic principles, but also it is intended to assure efficient and safe use of plumbing equipment and disposal of liquid wastes. Chapters cover the quality and weight of materials to be used; types of joints and connections; traps and cleanouts; interceptors, separators, and backwater valves; plumbing fixtures (including an analysis of the minimum number of fixtures that should be provided for the number of people using the facilities); hangers and supports; indirect waste piping and special wastes; water supply and distribution; drainage system; vents and venting; storm drains; inspection, tests, and maintenance. Appendices included for information but not a part of the standard make suggestions for an individual water supply and individual sewage-disposal system and suggest standards for trailer coaches and trailer parks.

The proposed standard was brought before the Standards Council of the ASA at a meeting held in New York last November. At that time organizations which had voiced objections to the code were given an opportunity to re-state their opinions to the Council, made up of representatives from the country's leading trade associations, professional societies, and consumer groups.

As there was general agreement at the meeting in favor of the code, the Council ordered that a letter ballot be taken.

The code is not mandatory. It is "national" in the sense that it is distinguished from the multiplicity of different codes which have only local recognition and acceptance, and that it is supported by a national consensus.

In addition to the sponsors, the following organizations were represented as members of the National Plumbing Code Coordinating Committee: U.S. Department of Commerce, American Society of Sanitary Engineering, Building Officials Conference of America, Conference of State Sanitary Engineers, National Association of Plumbing Contractors, Uniform Plumbing Code Committee, and the Western Plumbing Officials Association.

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[1] Copies available at $3.50 each.

[2] Dawson, F. M. The National Plumbing Code. *Strengthening America Through Standards.* (Proceedings of the Second National Standardization Conference, The American Standards Association, 70 East 45 Street, New York 17, N. Y., 1952. $1.00)

GOVERNMENT STANDARDS

By S. P. Kaidanovsky **Let's Bring the Record Up to Date** **15**

Since this feature has not appeared for several months, it seems advisable to describe briefly here some of the developments in connection with government standards which have taken place in the interim.

New Regulations Concerning Voting in Technical Committees by Members of the Department of Defense

Until recently the extent of participation permitted to members of the Department of Defense in such standardization bodies as the American Standards Association, American Society for Testing Materials, American Society of Mechanical Engineers, Society of Automotive Engineers, and others, was not clearly defined.

On September 13, 1954, a Department of Defense Directive was issued which establishes policies governing participation of liaison representatives of the Department of Defense in the activities of private or nongovernmental organizations or associations, including technical and professional societies.

These policies are as follows:

"1. Departments and agencies of the Department of Defense are authorized to participate in activities of scientific, technical, professional, and other organizations, societies, and associations in the discussions of matters of mutual interest, otherwise consistently with law, including antitrust laws, and laws relating to security.

"2. Participation by Departments and agencies of the Department of Defense in the activities of private or nongovernmental associations or societies shall be limited to the extent of the Department of Defense interest involved and shall be upon such basis as will avoid (a) the favoring of one association or organization over another; (b) the unauthorized acceptance of legal membership by the United States in a private organization; (c) the use of the name of the United States Government by a private organization, voluntary association, or corporation, implying the sponsorship of such organization by the government, without authority of Congress; (d) participation in the management and control of such organization without Congressional authorization; and (e) participation in the determinations or conclusions of private organizations or associations, in such manner as to suggest compliance therewith by the government without subsequent responsible administrative authority or Congressional authorization.

"3. Subject to the above limitations, liaison representatives of departments and agencies of the Department of Defense while participating in the activities of scientific, technical, professional, and other organizations, societies and associations, including technical committees and standards committees thereof, may give free and complete expression of their views on the subject matter under discussion and may vote verbally or in writing on issues presented for a vote, providing it is made clear to the private organizations, societies, and associations that such vote indicates no more than the opinion on that issue of the Department or agency voting. No vote so cast shall be considered to bind the Department of Defense or any Department or agency thereof in any way to any particular present or future course of action.

Mr Kaidanovsky is Technical Director of the Management and Technical Services, New York. He was formerly chairman, Federal Interdepartment Standards Council; technical consultant, Federal Specifications Board, and editor, Standards World.

"4. These policies shall not apply to membership or participation by officers or employees of the Department of Defense, as individuals, in private organizations or associations, including technical or professional societies, and military or veterans organizations, otherwise consistently with law, including the Hatch Act, and Anti-Lobby Act, and other laws which prohibit government officers and employees from engaging in activities inconsistent with their government employment."

Conclusion. In brief, the new directive permits members of the Department of Defense to participate in the activities of scientific, technical, professional, and similar organizations, including technical and standards committees thereof. The directive permits members of the Department of Defense to vote on technical matters but not on industry policies.

●

Department of Defense Materials Conservation

A Department of Defense Instruction of September 29, 1954, transferred the responsibilities for certain materials conservation and utilization functions, including supervision of the Joint Materiel Conservation Committee from the Assistant Secretary of Defense (Supply and Logistics) to the Assistant Secretary of Defense (Applications Engineering).

The Assistant Secretary (Applications Engineering) will have additional responsibilities for the following:

"1. Establishing the policies and procedures required for the execution of

an effective materials conservation and utilization program.

"2. Furnishing technical guidance with respect to material substitutions.

"3. Developing a reporting system designed to provide the basis for the measurement of materials conservation and utilization results achieved by the military departments and military contractors; and to provide the basis for determining areas for program emphasis.

"4. Collaboration with appropriate civilian agencies in the development of national policies and programs pertaining to materials conservation and utilization."

The Assistant Secretary (Supply and Logistics) will continue to be responsible for:

"1. Procurement policies, supply system management, disposal of surplus property and military-generated scrap.

"2. Determinations concerning the relative scarcities of the various critical and strategic materials and their possible substitutes.

"3. Providing the Department of Defense Material Conservation List and related information to the Assistant Secretary (Applications Engineering.)"

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Department of Defense Administration of Sampling Procedures for Acceptance Inspection

A Supply and Logistics Handbook, Inspection H105 has been issued by the Office of Assistant Secretary of Defense (Supply and Logistics). This Handbook covers the basic principles of sampling for acceptance inspection and provides instructions for administering the procedures established by Military Standards on the subject. Although the handbook has been prepared especially for administrators of acceptance inspection, it is suitable also for supervisory inspection personnel responsible for decisions of an operational nature.

A Military Standard for lot by lot *inspection by attributes* MIL-STD-105 entitled "Sampling Procedures and Tables for Inspection" is currently in effect. Inspection by Attributes is defined as "Inspection wherein the unit of product is classified simply as defective or nondefective with respect to a given requirement or set of requirements." Instructions for the use of MIL-STD-105 are covered in this handbook. Other Military Standards, such as a standard on *inspection by variables,* are contemplated or are in preparation. Instructions for their use will be added to this handbook as they are completed. Inspection by variables is defined as follows: "In variable inspection a quality characteristic of the unit of product is measured along a continuous numerical scale and is described in terms of its position along that scale. Thus, variable inspection takes account of the degree of conformance or nonconformance of the unit with specified requirements for the quality characteristics involved."

The Handbook consists of two parts. Part I "General Information on Sampling Inspection" covers general principles of acceptance inspection with emphasis on statistical basis of inspection. It consists of sections 1 to 8 entitled as follows:

1. Introduction
2. Realistic Standards of Acceptability of Product
3. Flexibility of Inspection System Essential for Economy and Effectiveness
4. Attributes Versus Variable Inspection
5. Sampling Plans
6. OC Curves[1] as Basis for Sampling
7. Fitting the Sampling Plan to Inspection Costs
8. Summary

Part II of the Handbook "Administration of MIL-STD-105" describes the use of sampling for lot by lot acceptance inspection by attributes. It consists of sections 9 to 21 entitled as follows:

9. Scope of MIL-STD-105
10. Acceptable Quality Levels
11. Amount of Inspection
12. Arrangement for Submittal of Product
13. Type of Sampling
14. Normal, Tightened, or Reduced Inspection at Start of Contract
15. Extraction of Sampling Plans
16. Drawing of Samples
17. Compilation and Maintenance of Inspection Records
18. Normal, Reduced, or Tightened Inspection during the Contract
19. Disposition of Rejected Product
20. Critical Defects
21. Examples Illustrating the Use of MIL-STD-105

Supply and Logistics Handbook, Inspection H105, "Administration of Sampling Procedures for acceptance Inspection" and MIL - STD - 105 "Sampling Procedures and Tables for Inspection by Attributes" are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., price 25 cents and 30 cents, respectively.

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New Policy Governing Standardization and Simplification Activities of the U.S. Department of Commerce

The Department of Commerce order 155 of July 9, 1954, states the duties and responsibilities of the Secretary of Commerce in the fields of standardization and simplification. The execution of these duties and responsibilities is delegated by this order to the Administrator, Business and Defense Services Administration within the Department of Commerce. The order also covers the following departmental policies and principles:

"1. The department recognizes its obligation to supply services to the

[1] Operating Characteristic (OC) Curve. The percentage of lots expected to be accepted by any given sampling plan is often plotted on a graph called an Operating Characteristic (or OC) Curve.

public in accordance with its statutory mandate;

"2. The department also recognizes that numerous private organizations, associations and other groups have an active interest in standardization and simplification;

"3. It is a basic policy of the department that it will avoid engaging in activities overlapping those of private enterprise;

"4. It is accordingly the policy of the department that its standardization and simplification activities should be undertaken only in discharge of its statutory obligation and where it clearly appears that it is under public obligation to undertake such activities;

"5. In determining whether particular standardization and simplification projects are to be undertaken the department will:

(a) Refrain from soliciting such projects,

(b) Upon application to it to undertake such projects, inform the applicant(s) of the availability of other known private facilities for the same general type of work or services,

(c) Prior to beginning on any such project, obtain from the applicant(s) a statement in writing that the applicant(s) desire(s) the department to undertake such project;

"6. It is the policy of the department to cooperate with all private organizations, associations, and groups in the formulation and issuance of proper voluntary standards and simplifications; and

"7. All such cooperation must be on a nonexclusive and nondiscriminatory basis as between the department on the one hand, and such private organizations, associations and groups on the other hand."

Conclusion. In brief, the Department of Commerce, which has as one of its functions to assist, coordinate, and cooperate in the voluntary establishment of commercial standards and simplified practice recommendations, permits carrying this function by the Business and Defense Service Administration without competing with or duplicating the activities of private or nongovernmental standardization bodies which could perform such work.

New York State Building Code Commission Issues New Code Manual

An article by the author, entitled "New Concept of Building Code Drafting and Administration" published in the March 1954 issue of THE MAGAZINE OF STANDARDS, stated that a draft of a new Code Manual has been prepared by the technical division of the New York State Building Code Commission and submitted to the Commission for approval.

Since then the new Code Manual for the State Building Construction Code has been issued. The new issue, dated June 1, 1954, pertains not only to one- and two-family dwellings but to multiple dwellings as well. In the first issue the text of the Code was included for convenience of users. The text has been omitted from the second issue to remove any possible confusion as to the fact that the Code Manual is not the law. The law is now to be found only in the two portions of the Code as presently promulgated. The preparation of this Manual in conjunction with the performance Code is a pioneering and logical step in the furtherance of modern building regulations.

The Manual is issued in loose-leaf form in order to permit insertions of future pages supplementing or superseding those contained therein.

The Manual, ix + 295 pages, 8½ x 11 inches, and profusely illustrated, can be obtained at $3.00 a copy, postage paid. Checks and money orders are to be made payable to the order of the New York State Building Code Commission and mailed to the Commission's Office at 1740 Broadway, New York 19, N. Y.

The Commission has published as a separate document a list of generally accepted standards which meet the requirements of the Code. This list, which contains the name and address of each organization issuing a particular standard and from whom copies may be obtained, is available, without charge, at the office of this Commission.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION CALENDAR OF MEETINGS

SUBJECT	ISO/TC No.	PLACE	DATE OF MEETINGS
Standardization in the sphere of banking	68	Paris	April 25-27
Safety Colors/Definition of safety colors	80/SC 1	The Hague	May 10-11
Screw threads	1	Stockholm	June 6-8
Limits and fits	3	"	9-11
Pipes and fittings	5	"	10-15
Drawings (general principles)	10	"	13-16
Steel	17	"	6-11
Copper and copper alloys	26	"	13-15
Solid mineral fuels	27	"	6-10
Cinematography	36	"	11-16
Pulleys and belts (including vee-belts)	41	"	13-16
Photography	42	"	6-10
Welding	44	"	6-9
Pallets for unit load method of materials handling	51	"	9-11
Gas cylinders	58	"	11-16
Marks indicating conformity with standards	73	"	7
ISO Council		"	11-15
ISO General Assembly		House of Parliament, Stockholm	17-18

Open House at
National Bureau of Standards

The work done by the National Bureau of Standards is of vital concern to Members of the American Standards Association, not only because of the Bureau's service to industry in general but also because of the fact that many standards approved by the American Standards Association are based on research undertaken by the Bureau. The National Bureau of Standards is a member of 124 sectional committees organized under the procedure of the American Standards Association and is sponsor of 20 of these committees.

Another close link between the American Standards Association and the National Bureau of Standards is the ASA Advisory Committee to the Bureau recommended by the Kelly Committee and requested by the director, Dr Astin. Members of the Advisory Committee are Roger E. Gay, president of ASA; J. R. Townsend, past-chairman of ASA Standards Council; A. S. Johnson, chairman of ASA Standards Council; Vice Admiral G. F. Hussey, Jr (USN, ret), Managing Director of ASA; and Cyril Ainsworth, Technical Director of ASA.—EDITOR

AT its first Open House in 17 years, the National Bureau of Standards recently demonstrated the work it is doing to develop the accurate standards of measurement required by modern science and industry. Several hundred leaders of science, industry, government, education, and publishing were the Bureau's guests.

The principal event was the first showing of two new radiation facilities — the NBS Gamma Ray and Betatron Laboratories. Guided tours of 14 other laboratories were included in the visit.

Commenting on the Bureau's program, Secretary of Commerce Sinclair Weeks, who greeted the guests, said: "Without such standards, we cannot keep pace with advances in science and technology. And if we do not keep pace in these fields, this nation is not going to survive in the world to come."

Dr Allen V. Astin, Director of the Bureau, illustrated his talk on "Physical Standards — the Cornerstone of Scientific and Industrial Progress" with scientific apparatus in actual operation.

Three of the Bureau's laboratories in which the guests expressed particular interest were those which demonstrated work in extremely low temperatures, atomic flames, and a new advance in high-speed electronic computers.

The work in low temperatures deals with the properties of matter within a few degrees of the absolute zero of temperature (—460 degrees Fahrenheit), where the motions of atoms and molecules are supposed to stop. Here many unusual and fascinating phenomena occur.

In the study of atomic flames, the Bureau is attempting to learn more about the process of burning so that fuels may be used more efficiently in industry.

The Bureau's new development in electronic computers is the *diamp*, a faster operating and more economical substitute for the transistor in the computer field. By use of the diamp, scientists hope to produce new superspeed computers even faster than those now in existence.

Low Temperatures

The Bureau has achieved some of the lowest temperatures ever recorded. In this work the Bureau is developing methods for accurately measuring temperatures approaching —460 degrees Fahrenheit (absolute zero). The guests were shown some of the equipment and materials used in this work. Certain gases, particularly helium, when liquefied have temperatures almost this low.

The guests were shown flasks of this extremely rare liquid and some of the effects it has on other materials. One of these effects is known as superconductivity. This phenomenon occurs when certain metals such as lead are cooled to a few degrees above absolute zero. When lead is at this temperature, it loses all its resistance to the flow of electricity. Once a current is induced in superconducting lead, it will flow indefinitely as long as the lead is kept below a certain temperature.

To demonstrate this, Bureau scientist Dr R. P. Hudson, assisted by Dr Ernest Ambler, showed the guests how a bar magnet would float over a lead dish immersed in liquid helium in apparent defiance of gravity. Dr Hudson said this was caused by the superconduction of the lead. Throughout the experiment the liquid helium gently boiled away at a temperature over 400 degrees below zero Fahrenheit.

At very low temperatures, Dr Hudson explained, the normal vibrating motions of atoms and molecules are greatly slowed down, and the properties of matter undergo extraordinary changes. For example, within a few degrees of the absolute zero of temperature (where all atomic and molecular motions are supposed to stop) liquid helium becomes a magic fluid showing characteristics of all three states of matter—solid, liquid, and gas.

This fluid, known as the "quantum fluid," passes through airtight seals without resistance. It also flows up the side of a containing vessel at remarkable speed in seeming defiance of the law of gravity.

The unusual properties of helium near absolute zero have been explained by mathematical theories which indicate that the very cold helium consists of two kinds of fluids. One portion is a normal fluid; the other is a superfluid which accounts for the unusual phenomena observed. The atoms of the superfluid are so cold they no longer bounce around, yet the attractive forces between are not great enough to produce a rigid solid like ice.

Dr Ambler also showed the visitors the apparatus which the Bureau recently used to line up the nuclei of radioactive elements so they would all face in the same direction. This result promises to provide a new tool in nuclear physics for studying the processes of nuclear disintegration.

The nuclei of atoms are little magnets which normally spin like tops. Radioactive nuclei had never been aligned in this country. The Bureau was able to do it by cooling the atoms of certain materials down to within a few thousandths of a degree of absolute zero. This slowed down the vibration of the atoms to such an extent that their nuclei lined up under the influence of the natural electric forces within the material.

Alignment of radioactive nuclei can actually be observed by noting the directions in which gamma rays are given off by the radioactive material. When a radioactive nucleus disintegrates by emitting a gamma ray, it acts something like a radio antenna, beaming its radiation in certain directions. By studying this beamed pattern, scientists can obtain an insight into the mechanism controlling the disintegration process and also measure the strength of the magnetism in the nucleus. Such information is of great interest in connection with atomic energy research.

Low temperature research is an area of pure science in which the objective is new basic knowledge about matter and the universe. Scientists are becoming increasingly interested in the remarkable phenomena that occur near absolute zero. At present over 80 laboratories in this country are engaged in low temperature research. The primary aim of NBS work in low temperature is to provide the new methods of accurate temperature measurement which science needs in order to advance in this important new field.

Low temperature research also provides new scientific techniques for understanding the basic properties of materials and for using them to better advantage.

Engineers are also becoming interested in the effect of extreme low temperatures on the strength of materials like metals and plastics.

Information of value to the deep freeze and refrigeration industries is being obtained at the NBS-AEC Cryogenic Engineering Laboratory in Boulder, Colorado. The Cryogenic Engineering Laboratory was an outgrowth of the Bureau's basic research program in low temperature physics.

Since its completion in 1951, this $3,500,000 installation has made possible large-scale production of liquefied gases—hydrogen and nitrogen—which had not previously been available in sufficient quantities for laboratory and industrial work. Its primary purpose is to investigate structural and other engineering properties of matter at low temperatures and to develop more satisfactory materials and equipment for low temperature use.

Atomic Flame Experiment

In the Bureau's high temperature spectroscopy laboratory, the visitors stared in semidarkness at a tube filled with a bluish green flame. Bureau physicist Dr H. P. Broida explained that the flame was produced by the direct combination of oxygen atoms with acetylene gas at very low pressure—less than 1/1000 the normal pressure of the atmosphere. This pressure is equivalent to an altitude of about 200,000 feet.

At present, Dr Broida said, no one knows what the actual temperature of this flame is. The measured temperature varies from 20,000 to 1,200 degrees Fahrenheit, depending on the type of thermometer used. The Bureau is attempting to devise a method of obtaining the actual temperature of the flame.

By studying this atomic flame, Dr Broida said, the Bureau hopes to obtain information that may eventually make possible new types of jet engines and rockets for operation at very high altitudes. A more immediate purpose is to learn more about burning under ordinary conditions so that industrial fuels may be used more efficiently.

When materials burn, their atoms combine chemically with oxygen atoms from the air. Atmospheric oxygen is in the form of molecules, each consisting of two oxygen atoms. In ordinary burning, before this oxygen can combine with the burning material, it must first be broken down into atoms by the heat of the flame.

In the Bureau's atomic flame experiment, the oxygen atoms are produced in quantity by an electric discharge, then introduced into a partially evacuated tube containing the acetylene. Because this apparatus permits the scientist to closely control burning conditions—such as the number of atoms, the pressure, and the concentration of fuel—it should make it possible for him to learn the answer to many puzzling questions about flames.

Some of the questions scientists would like to answer are: What actually goes on in a flame? What substances are present? What chemical reactions take place? How can the temperatures of flames be measured? The Bureau is attempting to obtain the answers to these questions, to develop methods for measuring the temperature of hot gases and flames, and to set up standards for flame temperature measurements.

Dr Broida also showed the guests a "jumping flame" in which vibrations had been artificially set up. The top of the flame rose and fell periodically in the burner. He said the Bureau is studying this type of flame because it is related to "flame-out" in jet engines.

When the flame of a jet engine goes out, it is often difficult to relight. It is important to understand the cause so that it can be prevented. One cause of the "flame-out" is vibration started in the engine. By

putting vibrations in a flame in the laboratory, scientists are better able to understand the more complicated problem in a jet engine.

The Diamp (Diode Amplifier)

Guests visiting the Bureau's high-speed computer, SEAC, learned of a recent important development. The Bureau has developed a substitute for the transistor which is a faster operating and more economical device as applied in the computer field. Conceived by Arthur Holt of the Bureau staff, the device is known as the diamp—short for "diode amplifier."

The diamp has many of the potentialities that accompanied the development of the transistor. It makes possible a compact, rugged, high-frequency amplifier for use in pulse-type circuits. Such circuits are used in computers and many other military devices. The diamp also requires much less power to operate than conventional vacuum tube systems.

The Bureau believes that the diamp, together with a previous invention of Mr Holt's for a very high-speed memory, offers a means for increasing the practical operating speed of computers by a factor of five to ten.

The military services originally sponsored most of the work in electronic computers and are particularly interested in higher speed machines. Such computers may be used for control of and defense against guided missiles.

Though present computers calculate with apparent lightning speed, there are also many important problems for which they are too slow. Such problems are found in science (particularly aerodynamics and nuclear physics), business, industry, and even in the Nation's growing traffic problems.

The diamp makes use of a previously unwanted characteristic of germanium and silicon crystal diodes. A crystal diode is a device similar to the transistor. However, instead of amplifying current as do transistors, the diode operates as a gate. It either passes or stops the flow of current through it.

In studying the diode to improve its characteristics, scientists at the Bureau saw the possibility of making the simple diode operate in fashion similar to the transistor. After further research they were able to perfect the device.

Important advantages of the diamp over the transistor are its higher operating rates, lower cost, and commercial availability.

Lecture-Demonstration

At Dr Astin's lecture-demonstration, the guests were shown a powerful x-ray technique for picturing on television the moving parts within an automobile or airplane engine. This technique was developed by Dr John S. Pruitt of the Bureau and announced for the first time at the Open House. The guests actually saw a moving TV image taken through steel walls of the internal parts of a small one-cylinder engine in operation. This was made possible by use of penetrating high-energy x-rays from the Bureau's betatron in combination with a TV transmitting and receiving system.

The Bureau's contribution to the technique was the development of a method for changing an invisible x-ray image to a visible light image. This is done by means of a crystal sensitive to x-rays. The second image is then picked up by television.

Audiences during the week also saw and heard a radiation monitor for atomic blasts being put through its paces by Dr Astin.

The radiation monitor is a remote-control system which automatically measures radiation intensities in the vicinity of an atomic explosion and transmits the data to a centrally located headquarters. The monitor was designed for the Atomic Energy Commission. Dr Astin demonstrated the device by getting a reading on the background radioactivity in the vicinity of Reno, Nevada.

He did this by calling one of the remote stations which is located there. The actual hookup was by phone rather than radio. The audience heard weird whistling noises coming out of the instrument. Dr Astin explained that the noises carried information on radioactivity. Meanwhile the device was printing out radioactivity on a roll of adding machine paper tape.

Guests at the lecture-demonstration also learned that the Bureau has been developing brightness standards for color television.

Color television tubes contain red, green, and blue fluorescent materials which in combination produce all the required colors in the image. The Bureau's television brightness standards are for use by the television industry to measure the brightness of the three components of color television tubes.

The visitors saw the Bureau's television standards in the form of squares of transparent colored glass, lighted from behind. The colors of the standards match closely those used in color television tubes.

Gamma-Ray Laboratory

The recent completion of the Gamma-Ray Laboratory will permit the Bureau to meet increasing scientific and technical demands growing out of advances in the use of atomic energy. Radium and its substitute cobalt-60, radioactive iodine, and many other radioactive materials are now widely used by doctors, industrial scientists, and defense workers. However, before they can be handled safely and effectively, they must be calibrated against the standards maintained by the Bureau.

Betatron Laboratory

The Betatron Laboratory houses the Bureau's 50-million volt betatron and 180-million volt synchrotron. These high-energy electron accelerators produce very penetrating x-rays. The Bureau's research enables industry, hospitals, and the military to use like machines safely for medical treatment of deep-seated cancer, industrial x-ray photography of tank hulls and other heavy-metal parts, sterilization of packaged foods, and nuclear physics research.

Both the betatron and the synchrotron have been used by the Bureau to develop an "x-ray televising" system in which invisible x-rays are converted to visible light for viewing on closed-circuit television.

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering please refer to the number following the title.

629.113 MOTOR VEHICLES

Spain (UNE)

Spark plugs, excluding those for aviation motors — UNE 10 004
Automobile generator 150 mm and 178 mm in diameter — UNE 26103/4

629.12 SHIPS AND SHIPBUILDING

Italy (UNI)

Rudder wheels — UNI 3519
Shaft end of rudder stock — UNI 3520

629.13 AERONAUTICS. AIRCRAFT ENGINEERING

Netherlands (HCNN)

Coordinate axes for aeromechanics — V 1811
Aircraft fuel nozzles. Grounding plug and socket — V 1846
Symbols and nomenclature for aeromechanics — V 995

631.3 AGRICULTURAL TOOLS AND MACHINERY

Germany (DNA)

Agricultural machine wheels: iron and iron-tired wooden and parts — DIN 11020

633 CULTIVATION OF SPECIFIC CROPS

USSR

Belladonna — GOST 3165-53
Rhubarb — GOST 2980-53
Camomile, Dalmatian and Caucasian — GOST 2628-53

633.5 FIBER PLANTS

USSR

2 grades of USSR grown raw cotton — GOST 6679/80

634.9 FORESTRY

Italy (UNI)

General nomenclature relative to different Italian wood species: standard lumber sizes — UNI 3517
Method for measuring assorted logs for the determination of volume — UNI 3518

637 PRODUCE FROM DOMESTIC ANIMALS

USSR

Process cheese — GOST 847-53

637.0 DAIRYING. MILK PRODUCTS

Rumania (CSS)

Physical, chemical, and bacteriological analysis — STAS 144

643.33 KITCHEN EQUIPMENT. OVENS. STOVES. COOKERS

United Kingdom (BSI)

Domestic cooking appliances for use with butane/propane gases—Part 1: Appliances for use with butane gases — BS 2491: Part 1:1954

643.35 KITCHEN UTENSILS

Netherlands (HCNN)

Nozzles for whistling kettles — V2161

Sweden (SIS)

2 types of frying spatulas — SIS 33 51 11/2

651.4/7 OFFICE ADMINISTRATION. EFFICIENCY. ROUTINE

Spain (IRATRA)

2 standards for commercial letterheads, size A4 — UNE 1013/14
Universal postal card form size A6 — UNE 1016

655 PRINTING, PUBLISHING

Sweden (SIS)

A4 sizes of advertisements, technical journals — SIS 73 12 22

United Kingdom (BSI)

Sequence of measurements for printed matter — BS 2489:1954
Layout of periodicals—a guide for editors and publishers — BS 2509:1954

66.0 CHEMICAL TECHNOLOGY—INDUSTRIAL CHEMISTRY

Spain (IRATRA)

Distillation of solvents derived from petroleum products — UNE 7072

662.2 EXPLOSIVE MATERIAL IN GENERAL

Spain (IRATRA)

Nomenclature and general classification of industrial explosive materials — UNE 31006
Apparatus for testing stability of nitrocellulose and coloidale powder at temperature over 100 C — UNE 31009/10

662.6/9 FUEL INDUSTRY

India (ISI)

Methods for sampling of coal and coke — IS 436-1953
Specification for size grading of coal and coke for marketing — IS 437-1953

Netherlands (HCNN)

Solid mineral fuels. Determination of crucible swelling number — V 3039

662.75 LIQUID FUEL

Sweden (SIS)

Determination of sulfur content — SIS 15 02 16
Determination of vapor pressure by Reids method — SIS 15 02 20
Determination of resin number — SIS 15 02 12

663.6 WATER, DRINKING AND INDUSTRIAL

USSR

Distilled water — GOST 6709-53

663.8 MIXED BEVERAGES, ETC

USSR

6 standards for different soft drinks — GOST 6682/7

665 OILS. FATS. WAXES

Mexico (DGN)

Neatsfoot oil — DGN R 28

South Africa (SABS)

Standard specifications for castor oil (technical) — SABS 403-1953
Standard specifications for petroleum jelly (petrolatum) technical grade — SABS 441-1953

Sweden (SIS)

Wood oil, specification — SIS 16 02 02

665.1/3 VEGETABLE OILS, FATS, WAXES

Argentina (IRAM)

Animal fats, determination of melting point of — IRAM 5552
Castor oil — IRAM 5540

665.4/5 MINERAL OILS, FATS, WAXES

Argentina (IRAM)

Method of test for anilin points and mixed aniline points — IRAM 6506
Petroleum solvents — IRAM 6512
White spirit — IRAM 6511
4 standards for different grades of aviation gasoline — IRAM 6513;-6515;-6518/9

Netherlands (HCNN)

Mineral oils, determination of anilin point — N 1946
Greases, determination of drop point — N 1950

Rumania (CSS)

Gasoline for automobiles — STAS 176
Refined mineral oil for export — STAS 3229

Spain (IRATRA)

Determination of carbonated residue in products derived from petroleum — UNE 7075

USSR

Tar pitch, technical requirements for — GOST 783-53
Heavy fuel oil, methods of determining thermal value — GOST 6712-53

666 GLASS AND CERAMIC INDUSTRY

Denmark (DS)

Glass container screw threads, gage for — DS F 393.3

Germany (DNA)

Testing ceramics, raw and finished — DIN 51031

Rumania (CSS)

Firebricks — STAS 136
Determination of stability of glass to chemicals — STAS 598
Testing of concrete — STAS 3518/9

667.4 WRITING INKS

South Africa (SABS)

Standards specifications for red writing ink — SABS 453-1954

United Kingdom (BSI)

Waterproof drawing inks — BS 2490:1954

667.6/8 PAINTS, VARNISHES, LACQUER, POLISHING MATERIALS

Argentina (IRAM)

Chrome green	IRAM 1055
Zinc yellow	IRAM 1083
Thinner for lacquers	IRAM 1096

Netherlands (HCNN)

Gum spirit of turpentine for manufacturing of paints and varnishes	N 887

Rumania (CSS)

Classification, nomenclature, symbols	STAS 2594

Sweden (SIS)

Red oxide pigment, specification	SIS 16 04 06

United Kingdom (BSI)

Ready-mixed oil-based priming paints	BS 2521-4:1954
Ready-mixed oil-based undercoating and finishing paints (exterior quality)	BS 2525-32:1954

668.3 ADHESIVES, GLUES, ETC

Germany (DNA)

General definition and classification of adhesive materials	DIN 16920

669 METALLURGY

Argentina (IRAM)

Carbon and silicon manganese steel bars for springs	IRAM 524
Foundry pig iron	IRAM 534
Spiegeleisen	IRAM 554
Ferroalloys, sampling for chemical analysis	IRAM 595

Germany (DNA)

Breaking test of butt-welded steel pieces	DIN 50127
Letter symbols for abbreviated designation of nonferrous alloys	DIN 1700

Italy (UNI)

Rolled round steel bars for manufacturing of bolts, nails, and rivets	UNI 3541
Special carbon steel and its alloys for case hardening	UNI 2953
Special carbon steel and its alloys for refining	UNI 2954
Microscopic examination of zinc and its alloys	UNI 3487
Macroscopic examination of zinc and its alloys	UNI 3488
Microscopic examination of copper and its alloys	UNI 3489
Macroscopic examination of copper and its alloys	UNI 3490
Microscopic examination of nickel and its alloys	UNI 3491
Macroscopic examination of nickel and its alloys	UNI 3492
Microscopic examination of lead and its alloys	UNI 3493
Macroscopic examination of lead and its alloys	UNI 3494
15 standards for methods of chemical analysis of various metal products	UNI 3495/3509
Method for sampling of ore for chemical analysis	UNI 3523
16 standards for methods of chemical analysis of manganese ores for the determination of content of different other minerals	UNI 3524/39

Mexico (DGN)

Rolled steel sheets for motor car building	DGN B 59

Netherlands (HCNN)

Chemical analysis of metal — Part 1: ferrous metals	N 1033
Nickel and chromium electroplated coating on steel and copper: quality standard	V 329

Rumania (CSS)

Bronze castings	STAS 197
Brass bands	STAS 290
Zinc plates	STAS 488
Round copper wire	STAS 683

Spain (IRATRA)

"Shore" method of hardness test of metals	UNE 7081
Broad steel plates	UNE 36561
Copper-zinc alloys of different grade, cold rolled	UNE 37104
Rolled copper plates, sheets, and strips	UNE 37105
4 standards for different grades of casting aluminum alloys	UNE 38212/5
4 standards for aluminum forging alloys of different compositions	UNE 38332/ 4;-38371

Sweden (SIS)

Cast iron, review	MNC 705
Structural steel, review	MNC 810
Tool steel, review	MNC 880
Sampling of steel for tension tests	SIS 11 01 20
Sampling of grey cast iron for tension tests	SIS 11 01 35
4 grades of cast iron	SIS 14 01 15;-14 01 20;-14 01 25;-14 01 30
Steel castings, grade 1305	SIS 14 13 05 E
Steel castings, grade 1505	SIS 14 15 05 E
Steel castings, grade 1606	SIS 14 16 06 E
4 grades of structural steel	SIS 14 13 10/11;-14 14 10/11
Tool steel grade 2722	SIS 14 27 22

United Kingdom (BSI)

Glossary of terms relating to iron and steel-Part 5: Bright steel bar and steel wire	BS 2094: Part 5:1954

USSR

Nickel and copper-nickel alloys, chemical analysis of	GOST 6689-53
Antimony, chemical test of	GOST 1367-53

669.3 COPPER

South Africa (SABS)

Standard specifications for phosphorous deoxidized nonarsenical and arsenical copper	SABS 404/405-1953

672 ARTICLES OF IRON AND STEEL

Argentina (IRAM)

Wrought iron crane chains	IRAM 577
Metal containers and parts for food preserves	IRAM 6003;-6007/8

672.6 CHAINS

Germany (DNA)

Round link chains for general use	DIN 766

674 WOOD INDUSTRY

United Kingdom (BSI)

Coal tar creosote for the preservation of timber	BS 144:1954
Pressure creosoting of timber	BSI 913:1954
Timber scaffold boards	BS 2482:1954

676 PAPER AND CARDBOARD INDUSTRY

Rumania (CSS)

Acceptance rules for paper and pasteboard	STAS 106
Paper for envelope type B	STAS 3649
Blotting paper	STAS 3666
Cigarette paper	STAS 3703
Bookbinder board	STAS 3704

681.84 SOUND RECORDING AND REPRODUCTION

United Kingdom (BSI)

Tapes and spools for commercial and domestic magnetic tape sound recording and reproduction	BS 2478:1954

683 HARDWARE

Sweden (SIS)

Locks for outward opening windows	SIS 54 42 10
Door locks	SIS 54 55 10

69 BUILDING CONSTRUCTION

United Kingdom (BSI)

Steel windows for agricultural use	BS 2503:1954
Wood doors and frames for milking parlours	BS 2504:1954

69.02/.07 STRUCTURAL ELEMENTS OF BUILDINGS

Sweden (SIS)

4 standards for windows and doors with windows	SIS 52 64 10/13
Windows and doors with windows. Quality requirements	SIS 56 70 01
Glass for elevator shaft door	SIS 53 18 11
Elevator shaft door, dimensions	SIS 56 64 10
Outer wall grating	SIS 57 62 10

691 BUILDING MATERIALS

Netherlands (HCNN)

Magnesium oxychloride flooring: nomenclature and specifications	V 1396

Spain (IRATRA)

Determination of specific gravity of stones	UNE 7067
Compression test of paving stones	UNE 7068
Determination of adhesive power and coherency of bituminous products	UNE 7074
Determination of specific weight and moisture absorption property of gravel and sand	UNE 7083

Sweden (SIS)

Concrete blocks, hollow and solid	SIS 52 42 10

Uruguay (UNIT)

Coarse aggregate for concrete	UNIT 102-54

691.3 CONCRETES, AGGLOMERATES, ETC

United Kingdom (BSI)

Coarse and fine aggregates from natural sources for concrete	BS 882:1954
Aggregates for granolithic concrete floor finishes	BS 1201:1954

691.5 LIMES. MORTARS. CEMENTS

Canada (CSA)

Specification for standard methods of testing of gypsum and gypsum products	CSA A82.20-1954

694 CARPENTRY, JOINERY

Denmark (DS)

Building code, Part 4: wooden constructions	DS 413

744 TECHNICAL DRAWING

Rumania (CSS)

Method of dimensioning	STAS 1145

778.5 CINEMATOGRAPHY

USSR

Core for cinematography films. Dimensions	GOST 3917-53

WHAT'S NEW ON AMERICAN STANDARD PROJECTS

Code for Pressure Piping, B31—

Sponsor: The American Society of Mechanical Engineers.

INTERPRETATIONS

Submitted by the Sponsor

Pending revision of the Code for Pressure Piping, ASA B31.1-1951, Sectional Committee B31 has recommended that selected interpretations be published for the information of those interested. While these do not constitute formal revision of the Code, they may be utilized in specifications, or otherwise, as representing the considered opinion of the committee. The following case is published as an interim action of Sectional Committee B31. It will not constitute a part of the Code until formal action has been taken by ASME and by ASA on a revision.

CASE No. 17

Inquiry: Is it the intent of Par. 105(*b*) that an allowable stress (*S* values) for materials not included in Table 1 must be assigned before the material may be used?

Reply: It is the opinion of the committee that the intent of Par. 105(*b*) is to require that a stress value assignment be made before such material may be used. In order to clarify the situation it is being recommended that Par. 105(*b*) and corresponding paragraphs in Sections 2, 3, and 4, be revised in accordance with the following:

(*b*) Should it be desired to use any materials or methods of manufacture not now covered by this code or which may be developed in the future, it is intended that the manufacturer shall provide details of design and construction which will be as safe as otherwise provided by the rules of the code. Where it is desired to use materials not included in Table 1, written application shall be made to the committee, fully describing the proposed material and the contemplated use, requesting that an allowable stress (*S* value) be assigned. Such materials shall not be used until the stress values have been assigned.

Industrial Diamonds and Accessories for Their Use, B67

Sponsors: American Society of Tool Engineers and Industrial Diamond Association

This recently organized sectional committee is working under the chairmanship of Clyde Fanning, General Motors Institute, Flint, Michigan. Mr Fanning is a member of the National Standards Committee of the American Society of Tool Engineers.

A subcommittee has already prepared a proposed nomenclature for diamond tools. Chairman of this subcommittee is Gil Stewart, representing the National Machine Tool Builders Association. This proposal is now ready for review by diamond tool manufacturers, machine tool builders, and others having an interest in the subject.

A second subcommittee is considering styles and dimensions of single point diamond dressing tools. This committee is headed by Jerry Krandall, representing the Industrial Diamond Association. Mr Krandall is vice-chairman of Sectional Committee B67. His subcommittee is attempting to reduce about 250 styles and sizes of diamond tools now being used to the number actually needed by the industry. It is thought this may eventually reduce the number to less than a dozen. "It is recognized that there will always be situations where special sizes and shapes are required to meet unusual conditions, but it is estimated that at least 90 percent of all dressing tools could be standardized," the committee reports.

Anyone interested in the proposed recommendations is invited to write to Mr Clyde Fanning, c/o General Motors Institute, Flint 2, Michigan.

Safety Standards for Lawn Mowers

Requested by: Lawn Mower Institute

Accidents sustained by Americans while mowing their lawns moved the Lawn Mower Institute to request an American Standard safety code for mowers.

This request was confirmed February 1 by a general conference of representatives of safety groups, insurance companies, lawn mower manufacturers, automotive engineers, and others interested. The conference recommended initiation of a project and organization of a sectional committee under the procedures of the American Standards Association. The committee will be concerned with safety specifications for reel and rotary lawn mowers, both hand operated and power operated.

The Lawn Mower Institute, whose membership represents about 75 percent of all mower manufacturers in the United States, will serve as sponsor for the project.

In requesting the project, the Lawn Mower Institute emphasized the need for an American Standard governing safety requirements which will be used voluntarily by the whole mower industry. "We recognize that the absence of a single recognized and authoritative safety standard for manufacturing design might lead to the adoption by various groups of their own standards which would be all different and which might result in an almost insurmountable manufacturing and distribution problem for the industry," the request stated.

Organizations interested in the project are invited to write the Lawn Mower Institute or ASA for representation on the committee.

Photographic Processing, PH4—

Sponsor: Photographic Standards Board

G. C. Alletag, representing the Phillip A. Hunt Company, has been appointed as secretary of Sectional Committee PH4. The re-elected chairman and co-chairman of the committee are J. I. Crabtree, Photographic Society of America, and H. A. MacDonough, Ansco.

AMERICAN STANDARDS

Status as of March 2, 1955

Acoustics

American Standards Approved—

Characteristics of Analyzers Used for the Analysis of Sounds and Vibrations, Method for Specifying, Z24.15-1955
Sponsor: Accoustical Society of America

Building

American Standard Published—

National Plumbing Code, A40.8-1955 $3.50
Sponsors: American Public Health Association; American Society of Mechanical Engineers
Minimum requirements for the materials and the installation of plumbing. Water supply and drainage systems, their fixtures, devices, and appurtenances, and methods of installation. Appendices on individual, trailer coach, and park systems, and administrative regulations.

American Standard Approved—

Non-Spark Conductive Oxychloride Composition Flooring and Its Installation, Specification for, A88.9-1955
Sponsor: American Society for Testing Materials; National Bureau of Standards

In Standards Board—

Building Code Requirements for Minimum Design Loads in Buildings and Other Structures, A58.1 (Revision of A58.1-1945)
Sponsor: National Bureau of Stds

Standard Submitted—

Standard Types of Building Construction, NFPA 220; ASA A110.
Sponsor: National Fire Protection Association

Consumer Goods

American Standard Approved—

Home Freezers, Method of Rating and Testing, B38.3-1955
Sponsors: American Society of Refrigerating Engineers; U.S. Department of Agriculture

In Board of Review—

Sampling and Chemical Analysis of Alkaline Detergents, Method of, ASTM D501; ASA K60.21 (Revision of ASTM D501-49; ASA K60.21-1950)
Sponsor: American Society for Testing Materials

Standard Submitted—

Computing Food-Storage Volume and Shelf Area of Automatic Household Refrigerators, Method of, B38.1 (Revision of B38.1-1944)
Sponsors: American Society of Refrigerating Engineers; U.S. Department of Agriculture, Bureau of Home Nutrition and Home Economics

Electrical

American Standards Approved—

Measurement of Interference Output of Television Receivers in the Range of 300 to 10,000 KC (54 IRE 17.S1) ASA C16.25-1955
Sponsor: Institute of Radio Engineers

Schedules of Preferred Ratings for Power Circuit Breakers, C37.6-1955 (Revision of C37.6-1953)
Sponsor: Electrical Standards Board

Natural Muscovite Mica Based on Visual Quality, Specifications for, ASTM D351-53T; ASA C59.27-1955
Sponsor: American Society for Testing Materials

In Standards Board—

Terms for Audio Techniques, Definitions of, ASA C16.24 (54 IRE 3.S1
Sponsor: Institute of Radio Engineers

Terms of Electron Tubes, Definitions of, C60.9

Terms of Magnetrons, Definitions of, C60.10

Terms of Gas-Filled Radiation Counter Tubes, Definitions of, C60.12
Sponsor: Joint Electron Tube Engineering Council

Standards Submitted—

NEMA Standards for Asbestos, Asbestos-Varnished Cloth, and Asbestos-Thermoplastic Insulated Wires and Cables, C8.36
Sponsor: Electrical Standards Board

Project Initiated—

Terminology for Automatic Controls, C85
Sponsor: American Society of Mechanical Engineers

Gas-Burning Appliances

American Standard Published—

Installation of Gas Piping and Gas Appliances in Buildings (Not Applicable to Undiluted Liquified Petroleum Gas), Z21.30-1954 (Revision of Z21.30-1950) $0.25
Sponsor: American Gas Association

Mechanical

American Standards Published—

Nomenclature for Gear Tooth Wear and Failure, B6.12-1954 (AGMA 110.02) $1.50
Sponsors: American Gear Manufacturers Association; American Society of Mechanical Engineers

Surface Roughness, Waviness, and Lay, B46.1-1955 (Revision of B46.1-1947) $1.25
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

In Board of Review—

Square and Hexagon Bolts and Nuts, B18.2 (Revision of B18.2-1952)
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

In Standards Board—

Ring-Joint Gaskets and Grooves for Steel Pipe Flanges, B16.20 (Revision of B16.20-1952)
Sponsors: American Society of Mechanical Engineers; Heating, Piping and Air Conditioning Contractors Association; Manufacturers Standardization Society of the Valve and Fittings Industry

Gas Transmission and Distribution Piping Systems, B31.1.8 (Revision of B31.1.8-1952)
Sponsor: American Society of Mechanical Engineers

Deep Well Vertical Turbine Pumps, Specifications for, B58.1
Sponsor: American Water Works Association

Withdrawal of Project Being Considered—

Rotary Cone Valves, B61
Requested by: American Society of Mechanical Engineers

Mining

In Standards Board—

Quarry Safety Code, M28.1
Sponsor: National Safety Council

Standard Submitted—

Recommended Practice for Drainage of Coal Mines, M6 (Revision of M6-1931)
Sponsor: American Mining Congress

Petroleum Products and Lubricants

In Board of Review—

Test for Distillation of Gasoline, Naphtha, Kerosene, and Similar Petroleum Products, Method of, ASTM D86-54; ASA Z11.10 (Revision of ASTM D86-53; ASA Z11.10-1953)

Test for Distillation of Natural Gasoline, Method of, ASTM D216-54; ASA Z11.11 (Revision of ASTM D216-53; ASA Z11.11-1953)

Test for Distillation of Gas Oil and Similar Distillate Fuel Oils, Method of, ASTM D158-54; ASA Z11.26-1953)

Test for API Gravity of Petroleum and Its Products, Method of (Hydrometer Method), ASTM D287-54; ASA Z11.31 (Revision of ASTM D287-52; ASA Z11.31-1952)

Test for Distillation of Crude Petroleum, Method of, ASTM D285-54T; ASA Z11.32 (Revision of ASTM D285-52; ASA Z11.32-1952)

Test for Neutralization Value (Acid and Base Numbers) by Potentiometric Titration, Method of, ASTM D664-54; ASA Z11.59 (Revision of ASTM D664-52; ASA Z11.59-1952)

Test for Saponification Number of Petroleum Products by Potentiometric Titration, Method of, ASTM D939-54; ASA Z11.67 (Revision of ASTM D939-52; ASA Z11.67-1952)

Test for Specific Gravity of Petroleum and Its Products (Hydrometer Method), Method of, ASTM D1298-54; ASA Z11.84
Sponsor: American Society for Testing Materials

Photography

American Standards Published—

Threads for Attaching Mounted Lenses to Photographic Equipment, Specifications for PH3.10-1954 (Revision of Z38.4.11-1944) $0.25

Photographic Grade Mono-para-aminophenal Hydrochloride, Specification for, PH4.135-1954 $0.25

Photographic Grade Isopropylamine 50 Percent Aqueous Solution, Specification for, PH4.178-1954 $0.25

Photographic Grade Benzyl Alcohol, Specification for, PH4.181-1954 $0.25

Photographic Grade Sodium Carbonate, Monohydrates, Specification for, PH4.227-1954 (Revision of Z38.8.227-1948) $0.25

Photographic Grade Sodium Carbonate, Anhydrous, Specification for PH4.228-1954 (Revision of Z38.8.228-1948) $0.25

Photographic Grade Sodium Tetraborate, Decahydrate (Borax), Specification for, PH4.230-1954 (Revision of Z38.8.230-1948) $0.25
Sponsor: Photographic Standards Board.

American Standard Approved—

Photographic Exposure Computer, PH2.7-1955 (Revision of Z38.2.2-1949)
Sponsor: Photographic Standards Board

In Board of Review—

16mm Sound-Focusing Test Film, PH22.42 (Revision of Z22.42-1946)

16mm 400-Cycle Signal-Level Test Film, PH22.45 (Revision of Z22.45-1946)

16mm Buzz-Track Test Film, PH22.57 (Revision of Z22.57-1947)

16mm Motion-Picture Projector for Use With Monochrome Television Film Chains Operating On Full Storage Basis, PH22.91

35mm Magnetic Azimuth Alignment Test Film, PH22.99
Sponsor: Society of Motion Picture and Television Engineers

In Standards Board—

Dimensions for 70mm Perforated Film for Cameras Other Than Motion Picture Cameras, PH1.20

Focal Length of Lenses: Markings, PH3.13 (Revision of Z38.4.4-1942)

Photographic Grade Hydroquinone, Specification for, PH4.126 (Revision of Z38.8.126-1949)

Photographic Grade Potassium Bromide, Specification for, PH4.200 (Revision of Z38.8.200-1949)

Photographic Grade Benzotriazole, Specification for, PH4.204 (Revision of Z38.8.204-1948)
Sponsor: Photographic Standards Board

Reaffirmations Requested—

Sound Focusing Test Film for 35mm Motion Picture Sound Reproducers (Service Type), PH22.61 (Reaffirmation of Z22.61-1949)

Buzz-Track Test Film for 35mm Motion Picture Sound Reproducers, PH22.68 (Revision of Z22.68-1949)
Requested by: Society of Motion Picture and Television Engineers

Pipe and Fittings

Project Requested—

Plastic Pipe
Requested by: Chemical Industry Advisory Board

Safety

American Standard Approved—

Specifications to Minimize Hazards to Children from Residual Surface Coating Materials, Z66.1-1955
Sponsor: American Academy of Pediatrics

In Board of Review—

Safety Code for Industrial Power Trucks, B56.1 (Revision of B56.1-1950)
Sponsor: American Society of Mechanical Engineers

In Standards Board—

Sanitation in Places of Employment, Minimum Requirements for, Z4.1 (Revision of Z4.1-1935)
Sponsor: Public Health Service

Prevention of Dust Explosions in Flour and Feed Mills, Code for, Z12.3

Prevention of Dust Explosions in Terminal Grain Elevators, Code for, Z12.4

Prevention of Dust Ignitions in Country Grain Elevators, Code for, Z12.13
Sponsor: National Fire Protection Association

Project Requested—

Safety Code for Lawn Mowers
Requested by: Lawn Mower Institute

EUROPEANS STUDY AMERICAN SAVINGS THROUGH MODULAR BUILDING

William Demarest, the U.S. building industry's expert in Modular Measure, early this year spent some time in Europe, advising European countries on this cost-cutting system of simplifying building dimensions. Mr Demarest was designated by the U.S. Government to describe this country's accomplishment in the use of the modular technique at a week-long inter-European conference on the subject. Mr Demarest is Secretary for Modular Coordination, Department of Education and Research, American Institute of Architects, and secretary of ASA Sectional

Committee A62 on Coordination of Dimensions of Building Materials and Equipment. He works closely with the sponsors of committee A62—the National Association of Home Builders, the Producers' Council, the American Institute of Architects, and the Associated General Contractors of America.

The effectiveness of Modular Measure in reducing building costs has impressed West-European countries, and they have undertaken a cooperative study of means of adopting modular dimensioning in their own building industries. This is entitled the "European Productivity Agency Project on Dimensional Coordination in Building," and about a dozen countries are taking part in it. Mr Demarest has reported that individual countries such as Sweden, England, and Belgium have studied Modular Measure in the past.

Technical Committee 59 on Building Construction of the International Organization for Standardization has organized Subcommittee 1 on modular coordination. This subcommittee has had a number of meetings, but has not completed recommendations.

In the U.S., the American Standard 4-inch Module has come into use at the "least common denominator" for simplifying the dimensions of buildings and the sizes of building materials. Most European countries contemplate the use of a 10-centimeter unit for the same purpose. The two "Modules," or dimensioning units, are almost identical, differing by less than 1/16th of an inch.

Although Modular Measure has been discussed at length elsewhere, it has so far come into wide use only in this country. Mr Demarest estimates that between 100 million and a quarter billion dollars worth of building construction has been erected from Modular drawings, using Modular-size materials. Contractors' reports are in agreement that Modular Measure does save money in actual practice by decreasing waste in materials and labor, reducing dimensional errors, improving the accuracy of cost estimates and in many other ways.

STANDARDS OUTLOOK

by LEO B. MOORE

CONSUMER CONCERN

Pioneering work has been done by many organizations in the field of standards to help the ultimate consumer buy better. These Consumer Standards have contributed materially to the ability of Mr Average Consumer to evaluate alternate choices in terms measurable by him and to make better decisions about the dollars he spends.

The average company standards engineer has remained remarkably aloof from this endeavor. If the consumer has the value to our business that we feel he has, then why do we not give more thought to him and reflect our interest in him through understandable standards of quality, performance, installation, and maintenance? I know that companies now do this to some extent, but not many seek or use the help of the standards department.

These comments are particularly pertinent at this time because I believe that the buying motives of the consumer today have acquired new dimensions. The old and accepted beliefs in what makes a customer buy—whim, style, beauty, popularity, emulation, good name—still have their place. But there also appear to be new and powerful motives that reflect increased interest in sound value. Two elements have contributed largely to this development—education and communication. More people now understand basic economics, watch the Cost of Living Index, have been made cost conscious by industry, are curious about government finances, and retain an inbred concern for money because they grew up in the 1930's. Every force prompts them to demand the facts and to compare the values.

The "do-it-yourself" and home workshop markets are two outgrowths of these consumer attitudes. Companies in these markets have become convinced of the desire of the consumer for technical facts and of his ability to assimilate them, weigh them, and make rational purchases based on them.

In the light of his own company, the standards engineer might worry through such problems as these:

1. How to assess general needs of the consuming public and revamp the product to meet these needs
2. How to educate the consumer to recognize critical characteristics and to measure them
3. How to convey exactly to the consumer how the product meets critical characteristics
4. How to help the consumer to identify his real requirements
5. How to help the consumer select the product that satisfies his particular need

The standards engineer who seizes this opportunity will face new problems and need new techniques, but will undoubtedly give new scope to his program and to the operations of his company as well.

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Mr Moore is Assistant Professor of Industrial Management at Massachusetts Institute of Technology where he teaches a full-term course in industrial standardization.

The Fruit of Experience Is Yours in the

1955 AMERICAN STANDARD

Surface Roughness, Waviness and Lay

B46.1-1955 24 pp 8½ x 11 in. $1.25

This new edition was developed when experience with earlier specifications on surface roughness, classifications, rating, and physical specimens gave data on changes needed.

Prepared by ASA Sectional Committee B46 on Standardization of Classification and Designation of Surface Qualities. *Sponsors:* The American Society of Mechanical Engineers; Society of Automotive Engineers.

MOST IMPORTANT CHANGES

- ***Eliminates root-mean-square average rating. Adopts arithmetical average rating.***
- ***Defines roughness-width cutoff. Establishes standard cutoff values. Committee members say this will eliminate one major cause of misinterpretation of instrument reading.***
- ***Incorporates in one document specifications on surface roughness, waviness, and lay formerly given in American Standard B46.1-1946 and specifications for physical specimens of surface roughness and lay formerly given in American Standard B46.2-1952.***

WHAT AMERICAN STANDARD B46.1-1955 CONTAINS

- ***Defines terms and classifications of surface characteristics***
- ***Provides rating value tables in microinches and in inches***
- ***Lists symbols for use in indicating direction of lay***
- ***Illustrates application of symbols and ratings***
- ***Provides specifications for precision reference specimens and roughness comparison specimens***
- ***Provides requirements for tracer type instruments***
- ***Appendices (not a part of the standard) give supplementary information and examples on symbol proportions; arithmetical average; notes for drawings; how to use and interpret tracer instruments; how to use precision reference specimens with stylus instruments; control of surface roughness; chart showing surface roughness available by common production methods.***

This standard deals only **with the height, width, and direction of surface irregularities, as these are of practical importance in specific applications.**

It does not **Cover luster, appearance, color, corrosion resistance, wear resistance, hardness, micro-structure, and many other characteristics which may be governing considerations in specific applications.**

- **Define the degrees of surface roughness and waviness or type of lay suitable for specific purposes nor specify the means by which any degree of such irregularities may be obtained or produced.**

American Standards Association
Incorporated
70 East 45 Street
New York 17

Please send me _____ copies of American Standard Surface Roughness, Waviness, and Lay, B46.1-1955 at $1.25 each.

Remittance enclosed ☐ Send invoice ☐

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____